UGANDA PROTECTORATE

A Development Plan for Uganda

By

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With a Foreword by His Excellency The Governor of Uganda

"Uganda . . . . is alive by itself. It is vital; and in my view, in spite of its insects and its diseases, it ought in the course of time to become the most prosperous of all our East and Central African possessions, and perhaps the financial driving wheel of all this part of the world. . . .

My counsel plainly is: 'Concentrate upon Uganda.' Nowhere else will the results be more brilliant, more substantial, or more rapidly realised."

(WINSTON CHURCHILL — 1904).

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FOREWORD

*Some Notes on the Economic Development of Uganda

By His Excellency The Governor of Uganda

The Uganda Protectorate has a total area of 93,981 square miles, of which 13,610 square miles are open water. Of the land area of 80,371 square miles approximately 3,000 square miles are game reserve and 2,470 square miles are swamps. Considerably more than one-third of the whole land area of Uganda is affected by the presence of tsetse fly, leading to the depopulation of vast areas, and the tsetse fly is advancing at the rate of five miles a year on a wide front. The remaining land area has to support a population of about 4,000,000 souls.

No census has been taken since 1931 but there is little doubt that under the influence of improved health services and better standards of living the population is steadily increasing. That population also is progressively demanding more out of life—better food, better housing, more education, more amusement, more cash to expend on consumer goods.

The whole wealth of Uganda, apart from the human factor (labour and services) which will be discussed later, is to be found in the products of its soil and its waters, and the primary and secondary industries dependent thereon; and the problem is to find means whereby that wealth can be so conserved, developed and exploited as both to provide adequate subsistence in its broadest sense for the present population and for the expansion of population which is to be expected in the future, and also to support the social and other public services of which that population will be in need.

In Uganda the increase of human fertility is, as elsewhere in East Africa but possibly to a less marked extent, accompanied by a gradual decrease of soil fertility. This tendency undoubtedly can be checked by the more general application of improved agricultural methods of conservation and regeneration such as those which have already been introduced with some success in the Teso District and elsewhere. Both the need to protect the soil against exhaustion in its various forms by rotational resting under grass, and the demand by the cultivator for a greater cash return from his land, point to larger holdings. The present average holding is less than four acres. This circumscription of area is imposed not so much by shortage of cultivable land—for in many districts large areas of land are still available for cultivation—as by the area of land that a peasant and his family can cultivate by the use of the hand hoe during the limited period available for preparation and planting before the seasonal rains. Even with this small area, food crops are apt to be neglected in favour of cash crops. If, therefore, in order to preserve the fertility of the soil and to provide the peasant with a greater return from his land in cash and kind, larger holdings are necessary, it follows that human labour must be supplemented by mechanical implements.

What has been written so far presupposes the continuance in Uganda of a system of peasant agriculture based primarily upon small individual holdings; and it might be well at this stage to examine this premise because it is a vital and limiting factor in any discussion of the potential wealth of the territory. There is little or no doubt that Uganda, with its rich soil, normally ample rainfall, and vast lakes, could be more efficiently and profitably developed by a system of large estates or concessions owned and operated by Europeans. That is axiomatic. But to adopt such a system in Uganda would be directly opposed to the established policy which aims at developing Uganda for the benefit, not of imported Europeans or Asians, but of its African population. By parcelling out Uganda into large European estates based upon optimum economic units, or by conceding fishing rights over Uganda's lakes to European-controlled companies, there is no doubt that greater wealth would be produced, and would be produced more quickly. It is possible also that a larger

* These notes were prepared by the Governor of Uganda in April, 1946 to provide a background for Dr. Worthington's investigations

African population could by this means be maintained. But this would create problems far more intractable than any that it would solve. The cultivable land and, it is submitted, the lakes also, are held in trust for the Africans, and in accordance with the accepted policy of Government no large areas of that land should be alienated to non-Africans unless it can be shewn that such alienation will promote the economic or social welfare of the inhabitants of the territory.

Collective farming on the Russian model might be an alternative, and it may become practicable and indeed desirable when the general level of intelligence of the peasantry has been raised by education and welfare services. But at present it would involve regimentation and dragooning, which I am convinced would be unacceptable to the vast majority of the African population. It could not be introduced today without compulsion, and although in the matter of agricultural practice compulsion of a small minority who are standing out against the wishes of an enlightened majority may be practicable and permissible, it can never successfully be adopted when it is the majority that are unconvinced and have to be coerced. Nor could compulsion ever succeed in such circumstances if imposed by an alien Government.

We are thus left with the fact that Uganda is and must remain for the present at all events primarily a country of peasant agriculture; and the purpose of this memorandum is to examine, given this limiting factor, how the country can best be developed and its natural wealth exploited to full advantage.

Let us consider first the human factor. Are the people of Uganda likely to constitute a favourable or an unfavourable factor in the production of wealth ? Unfortunately the present answer must be : unfavourable. Speaking generally, and judging by European standards, the Africans of Uganda are indolent, ignorant, irresponsible and not infrequently suspicious of foreign intervention. But that is only one side of the picture. Their indolence is in large measure attributable to malnutrition and debilitation from disease; and the truth of this has been vindicated by the dramatic effect of good feeding and proper medical attention on the African soldier during this war.

Moreover, their unsatisfactory performance as a labour force is, I am convinced, largely due to the conditions of their employment. Bad housing, bad feeding, bad pay, unsympathetic and unimaginative handling by alien employers, dull and distasteful work, make so unattractive a sum total as to provide no inducement to honest labour or reasonably high performance. There is at present nothing in his conditions of employment which the labourer minds losing. The employers largely come from India where with its teeming millions the ever-present threat of starvation always provides employers with a cheap and inefficient labour supply. Uganda employers do not, or will not, understand that in normal years that threat does not operate in Uganda and that to get good labour one must provide attractive conditions of employment. They ultimately will learn this self-evident fact, a fact which a very few East African employers, European and Asian, have already recognised to their great financial benefit. Until employers in general provide conditions for their labourers which those labourers appreciate and are anxious to retain, until, to put it crudely, labourers are apprehensive of, instead of indifferent to, being "sacked", there will be little permanent improvement in the quality of African labour. Labour today is lowly paid but it most certainly is not cheap.

Another contributory cause of idleness is to be found in the almost complete absence of consumer goods in the shops, which discourages any sustained effort to earn more money. It has been estimated that in parts of Uganda up to fifteen per cent. of the cotton crop is left unpicked because, having paid his tax, the cultivator can find nothing in the shops on which to spend his money. The same reason—lack of consumer goods—probably explains the fact underlined in the recently published report of Major Orde-Browne, that the out-turn of the African labourer today is little more than one-half of what it was before the war.

Given better feeding and better medical services, better conditions of employment and the stimulus of a full range of goods at attractive prices in the shops, it is surely not unduly sanguine to look for a marked improvement in the matter of idleness, indifference and irresponsibility which are such disturbing features of the present-day African labourer and cultivator.

The ignorance of the Uganda African, and the suspicion which is largely bred of ignorance, represent faults which, as civilian and army educationists have proved, are definitely curable, provided that education is not allowed to bring in its train, as it has done elsewhere in Africa and Asia, the political distempers and social malaise which in turn breed even more harmful suspicions and discontents.

In one vital respect at least our administrators in Uganda, educationists and others, have signally failed. They have failed to eradicate the belief that physical labour is socially degrading. They have failed to impress upon the African the dignity and necessity of physical toil, of working with his own hands. As education spreads, so the number of persons prepared to undertake any work with their own hands diminishes in inverse ratio. Once a boy has passed through the primary school he considers that he has automatically joined the ranks of those who order others to work, and that any physical labour by himself would be derogatory. Whether responsibility for this failure rests with the education system or with those entrusted with its administration, I cannot say. But whatever the cause the fact remains, and it is a very disturbing fact and particularly serious in a basically poor country like Uganda which is only now beginning to emerge from the primitive and which can only be developed by hard and sustained work.

Broadly speaking, therefore, the African population, although it should be capable of greatly improved output, constitutes now and in the near future an adverse rather than a favourable factor in the development of the country's potential wealth.

We have thus two seriously limiting factors—a predominantly peasant agriculture and an inefficient labour force. We have also temporarily on the debit side a rapidly increasing population which some students think will double itself in a quarter of a century; land which is progressively losing its fertility and from which the peasant cultivator will demand and need in future a greater cash return; and the ever advancing menace of the tsetse fly which has already swallowed up more than one-third of the land area of Uganda. That is by no means the whole of the debit side. Uganda boasts practically every disease of man and cattle known to tropical and temperate climates, and many of these diseases exist under conditions rendering medical or veterinary control by conservative methods especially difficult. In the matter of communications with her seaport, Uganda suffers from the crippling disadvantage of being situated at the end of 879 miles of railway system which in Uganda meanders over the map on an alignment which was dictated by political and not economic considerations. In addition, Uganda has no local supply of fuel except that most inefficient of fuels, wood.

Those are the principal items on the debit side. Happily there is a credit side. Nature has in general been kind to Uganda. On the whole the soil is rich, and even where impoverished by man it is capable of restoration. Although recently Uganda, in common with many other countries, has suffered from a cycle of partial drought, the rainfall is normally ample. As yet there is no real land hunger, and such pressure on land as does exist in a few areas can still be remedied by relatively small adjustments of population. There is today cultivable land available for all who care to cultivate it. To meet the needs of future generations there is the vast reserve of land now largely, and as I confidently predict only temporarily, closed to human habitation by tsetse fly.

The vast lakes which are so pleasant a feature of the Protectorate and which are believed to have an abundance of excellent fish, are at present largely unexploited in an economic sense. The return in animal protein food from an acre of water should be at least as great as from an acre of land. At present the return from 13,610 square miles of water is negligible.

Although the population judged by European standards, is at present ignorant and idle, it is as a whole friendly, malleable and responsive. Its faults are eradicable ; its virtues should, with sympathetic handling, survive.

Uganda has a wide range of precious and semi-precious mineral deposits, and in addition it has deposits of excellent lime and of phosphates which may well prove of great economic significance.

How can all these potential assets be so developed as to prevail over the debit side of the balance sheet? First and foremost it must be accepted that there can be no "get-rich-quick" for Uganda. There is no simple, single specific for producing wealth. The process must inevitably be slow, progressive and multiform. A country's economy has many facets; none must be neglected.

Let us take land first. I have already indicated that, if not today then tomorrow, larger individual holdings will become necessary both to allow for the conservation of soil fertility by rotational resting under grass (or sugar which is believed equally to restore the crumb structure of the soil) and to permit of an increased cash return to the cultivator ; and I have mentioned that this will not be practicable unless human labour can be supplemented by the use of mechanical implements. These implements (ploughs, rotary hoes and the like) are at present beyond the means of the peasant cultivator, and even on an enlarged holding would be idle much of the year and therefore uneconomical. This suggests communal ownership, and that in turn suggests co-operative societies for primary producers, the formation and organisation of which the recently enacted Ordinance was intended to promote. These co-operative societies, which in turn would be linked to co-operative unions which would take care of the local storage and marketing of agricultural produce, could obtain, maintain and lend to their members the agricultural plant and equipment without which larger holdings would not be a practical proposition.

But these co-operative societies, although providing a very useful channel for agricultural propaganda, will not in themselves produce a revolution in agricultural methods leading to proper methods of soil conservation and regeneration. Unless checked, the wasteful use of soil will go on, affecting a progressively larger area of the Protectorate. These societies, however, may and should promote a tendency towards consolidation of agricultural holdings leading to the formation of village communities—so strangely and unfortunately lacking at present—and may ultimately prepare the way for some form of collective farming.

In the meantime, however, better methods of husbandry must be introduced and generally applied so as first to conserve and then to increase the fertility of the soil. These methods are now pretty well proved, resting, mulching, manuring, strip-cropping, terracing, etc. ; and our difficulty is not so much to devise means of improving agriculture—although research on this subject must and will continue—as to induce the peasantry to adopt those means. A recent writer in *The Times* suggested that to this end compulsion should be used. But as I have indicated elsewhere in this note compulsion can only be successfully employed in the introduction of new and improved methods of agriculture when the vast majority of the culivators have already been voluntarily converted to those methods and convinced of their benefits ; only then can compulsion properly be used to bring into line the small and recalcitrant minority.

The only successful means of introducing and spreading better conceptions of agricultural practice is by precept and example, by exhortation and demonstration, by supervision and propaganda. There is no short cut. The agricultural population in every country—and the United States of America and the United Kingdom are no exceptions—are slow to accept and even slower to adopt a new idea. One must just go on plugging at it—one idea at a time, not two or three for that causes confusion—until it is accepted and applied. But there is no harm, and indeed every advantage, in multiplying the channels of propaganda, provided that they are centrally directed and controlled. So in addition to the Agricultural Department, whose expansion of staff should be subject to no purely financial circumscription but should be limited only by the numbers that can be

profitably employed, and in addition to the handmaid of all, the Provincial Administration, there must be other channels of propaganda, and these it is hoped to provide by means of the new Public Relations and Social Welfare Department whose mobile units will be charged with the duty, *inter alia*, of popularizing and explaining measures and methods directed to improving the standard of production and standard of living of the agricultural population.

Every means, active and continuous research and energetic measures in the field, must be used and fully developed to stimulate better and more productive methods of agriculture. The soil of Uganda can produce, as has been demonstrated, not only excellent food crops but also cotton, coffee, tea, tobacco and flax, of high quality. It must be so husbanded as to produce these crops in greater quantity and in better quality.

It is not impossible that the large deposit of phosphates near Tororo, which must rank among the larger deposits of phosphates known, used in conjunction with soda ash from Magadi, may offer a means of greatly increasing the productivity of the soil. It might indeed pay Government to distribute this compound to cultivators at less than cost price. But its precise effect on the yield of cotton and other crops is still the subject of experiment.

What has been said above of agriculture applies in large measure to the related activities of animal husbandry and forestry. The need for departmental expansion, and for propaganda and demonstration in order to stimulate in the one case better methods of animal husbandry and in the other progressive re-afforestation, exists and is no less urgent than in the field of agriculture. Already there are encouraging signs of improvement in animal husbandry, notably in the Kyadondo County of Buganda, where the cattle industry associated with mixed farming has made an advance which few would have predicted as possible ten years ago. Here improved methods have brought with them such demonstrably high financial returns that they can scarcely fail to extend beyond their present borders.

A plan for bringing to Kampala the surplus cattle from Karamoja and the north in order to satisfy the rapidly growing demand for meat in Buganda and Busoga is now being worked out in detail. It should serve the dual purpose of reducing overstocking in the north and relieving the great shortage of meat in the more sophisticated south.

In the principal cattle-producing areas the clamant need is for more water supplies, and this need is being increasingly met by the operations of the Water Supplies Section of the Geological Department. Provision for the expansion of this vital service of providing bore-holes and dams has been made in the Colonial Development and Welfare programme for Uganda.

But the cattle industry, even more than agriculture, is hampered and impeded by disease; and of all diseases affecting cattle by far the most serious and menacing is trypanosomiasis, for not only does this disease kill, but the presence of its vector closes to cattle the pasture lands that they need and thus indirectly causes overgrazing and ultimate erosion.

This brings us back to the ubiquitous tsetse fly. The presence of this fly over more than one-third of the land area of Uganda has been mentioned as a debit item on our economic balance sheet. I believe that it can and will be converted to an asset, for if we can find a means of countering the ravages of this fly we shall release to the cultivator and the herdsman that vast area of land which, owing to the presence of the fly has lain fallow and has been enriched by the natural compost of ages. I am not so pessimistic as to believe that the united efforts of scientists and field workers will not succeed in finding an answer to the fly ; for if they fail there can be no economic or social future for Uganda.

Already research into this vital problem is being organised along three distinct but inter-connected lines. In the laboratory research into the pathology of the disease in human beings and animals will be pressed forward with the intention of finding a prophylaxis. In the field a unit operating on an East African basis will be charged with expert survey and reclamation work.

Already new methods of field control are coming to light and being brought into use. Again, both in the laboratory and in the field a team of scientists is working on the problem of how to apply to the tsetse fly with best effect the new insecticides, D.D.T. and 666, which are known to be fatal to it. Already American scientists claim to have produced an emulsion of D.D.T. which will remain on cattle for eighty days after application and will for that period continue to kill all flies and ticks (such as those which produce East Coast Fever) coming in contact with the treated animal. Although D.D.T. is a slow killer, there are grounds for believing that once a fly has absorbed any of this compound through its feet it ceases to feed and is therefore harmless.

Surely by one or more of these lines of approach the problem of the tsetse fly will be solved. But in order to check the inroads of the fly meanwhile and in order to apply the new methods when they are evolved, it is clear that the Uganda Government must without avoidable delay form its own field service of reclamation and survey, organised as a separate department and under an independent and energetic Director.

Before leaving the subject of soil it would be well to mention two allied questions which have been exercising the Uganda Government for some time. Of these the first is the problem of desiccation in Karamoja and the second is the economic possibility of swamp drainage. Both find a place in the original post-war development plan of the Protectorate. A good deal has been written and said about the alleged progressive advance of desert conditions in Karamoja and of the imminent danger of those conditions extending south into Teso. This desiccation, it has seriously been suggested, has crept in from the Western Turkana as a kind of malign and obscure infection. A note almost of hysteria has crept into the discussions of this subject. I am myself persuaded that the danger has been greatly exaggerated. Actually the cause of the desiccation, both in Karamoja and in the Western Turkana, is the same—bad husbandry—and the only answer to the problem is not, as has been suggested, immediate vast expenditure and drastic reclamation on the American model, but a long-term policy of gradual regeneration, employing not one but a number of correlated and well-established methods of conservation, aimed primarily at the progressive development of mixed farming and the restoration of vegetation and soil cover. The introduction of primitive measures of irrigation akin to those which are so successfully employed in Southern Arabia, would undoubtedly assist the process.

But although no rapid advance of desiccation is to be feared, a rapid advance of tsetse fly has already occurred in Karamoja and has been allowed to continue unchecked, and this constitutes a real and immediate danger, for it has had the effect of restricting still further the pasture land, already overgrazed, available to this primarily pastoral people.

On the question of marsh drainage the Uganda Government has recently had the advice of a well-qualified irrigation engineer, Mr. A. E. Griffin. He has recommended a cautious policy of initial experiment and research into the hydrological and climatic problems associated with any extensive programme of marsh drainage. Effect is being given to this advice ; but in the meantime some controlled marsh drainage has been carried out with marked success in Kigezi District, where the nature and altitude of the country would seem to afford a safeguard against any adverse effect upon climate and rainfall.

Reference has been made to the mineralogy of Uganda, and on this highly technical subject there is little that can usefully be said in this note. That a wide range of precious and semi-precious metals exists in Uganda is established, but as yet geological research has, generally speaking, disclosed traces only of these metals and under conditions which in normal times would be unlikely to repay full-scale commercial exploitation. The scanty tin deposits are already, under the stimulus of war-time prices, believed to be nearly exhausted. Apart from a very limited area in the neighbourhood of Busia, only alluvial deposits of gold have so far been found. Copper undoubtedly exists but at so great a distance from the present rail-head as to discourage commercial development

except in the unlikely event of present inflated world prices being maintained; and the same consideration applies to wolfram.

There is no doubt that the discovery of gold or other precious metals in quantity and form suitable for full-scale development would greatly simplify the economic problems of Uganda as it has done in South Africa and elsewhere; but although research and investigation by the highly efficient Geological Department of Uganda will be energetically pursued, it is as well to realise that the prospect of such a discovery is now regarded as remote.

A possible use for the large deposits of phosphates near Tororo has been suggested earlier in these notes; it is unlikely to be a direct source of wealth although it may be of great indirect value to Uganda.

The extensive deposit of exceptionally high quality lime at Muhokya (Toro District) suggests the possibility of promoting the manufacture of cement on a large scale with a view to capturing part at least of the expanding East African market. But here, as in the case of copper, the long road haul to rail-head at present interposes a serious obstacle to commercial development. If, as seems probable, the Kenya and Uganda railway system cannot profitably be extended to Fort Portal, then serious consideration must be given to the possibility of continuing the Fort Portal–Kitoma road down the escarpment to Ndaiga Bay at the south-eastern extremity of Lake Albert, where a link could be provided with the lake steamer service. But although the distance in road haul would thereby be reduced, the handling charges at Ndaiga, Butiaba, Masindi Port and Namasagali would, I imagine, absorb much of the resultant saving.

The existence of natural mineral deposits in Lake Katwe and in neighbouring crater lakes, which is now the basis of a primitive Native Administration salt industry, undoubtedly offers opportunities for further development. This matter is at present under examination by the East African Industrial Council.

Mention has been made of the absence of any natural fuel supply in Uganda except wood; but this statement requires qualification. In the Lake Albert region the geological structure is favourable to the presence of oil and there are definite indications that oil exists. Here exploration on a commercial basis was undertaken for a few years before the war and although this was discontinued at the outbreak of war without oil in commercial quantities having been struck, the search must obviously be pressed forward, if not by private enterprise then under Government auspices, because the presence of oil in quantities which would repay commercial exploitation might well change the whole industrial and commercial picture of Uganda.

I pass now to the lakes of Uganda as a potential source of wealth. The scientific aspect of this subject has already been fully dealt with in the reports of Dr. Worthington. His reports show that a lot has still to be learnt of the habits of the fish, their breeding grounds, their feeding grounds, their seasonal movements, their areas of greatest concentration, their numbers and whether increasing or decreasing and why. All this information and much more is needed if a greatly expanded fishing industry is to have a solid and enduring foundation. That means fishery research, and a research station with its headquarters at Jinja is already planned and approved. Then there must be effective fishery control or the knowledge obtained by research will be of little practical value. That means a well-staffed and properly equipped Fisheries service, and the need for such a service and the general lines on which it should work are already accepted.

But it cannot rest at that. As in agriculture, so in fishing, the human factor can defeat the best and most scientifically devised schemes; and unless the Uganda fishermen improves his present primitive methods no amount of research or control will get us anywhere. What is wrong with those methods? Mainly, I suggest, the type of craft used which, in Lake Victoria and Lake Edward, is a crazy sewn canoe and in Lake Albert a primitive form of dug-out. The former, whose useful life is little more than twelve months, leaks like a sieve from the moment of launching and needs

a crew of some ten men paddling and baling. Amongst this formidable number the exiguous catch has to be distributed, and, not infrequently, those who have provided credit for the purchase of the canoe or of the fishing nets claim a substantial share also. In this canoe fishermen rarely can venture far from the shores of the islands or the mainland, never remain out at night, and are always subject to the risk of disaster from the frequent sudden storms on the lake. The dug-out is more lasting but little more efficient. Neither can be successfully or safely sailed. Consequently the deeper and more distant waters of the lakes are completely neglected and the inshore waters are overfished.

The fishermen already show a tendency to form themselves into so-called co-operatives, and this tendency will need to be encouraged under the new Co-operative Societies Ordinance. With the formation among fishermen of these societies on a sound financial and legal basis, and with European supervision and stimulation, it will become possible to provide the funds, cash or bank credit, to enable more seaworthy and more enduring fishing craft to be used. Something on the lines of the American chine-pattern boat, similar to that already used under sail by the fishermen of Kisumu, would probably meet the case. At first these craft could be used under sail, but later outboard motors (the design of which is reported to have greatly improved during the war) should be added.

In order to familiarise the Uganda fishermen with this type of craft and to popularise its use, arrangements have been made for the Sese Islanders and the fishermen on the lake shores to be visited by fishermen from Kisumu in one of these craft. These visitors will stay for three months in Uganda waters. Further, a boat builder from Kisumu, skilled in the construction of these craft, will also pay a three-months' visit to Uganda so as to interest and instruct the Uganda canoe builders in the building of this far more seaworthy and practical fishing boat. This is a mere beginning which it is intended to follow up and develop, using for this purpose the Government Technical School, in the hope that the building of these craft will become a valuable secondary industry on our lake shores and islands.

The marketing of fresh, smoked and dried fish will have to be most carefully and intelligently organised on a co-operative basis, probably with European advice and supervision. There is a large and at present unsatisfied demand in the Belgian Congo which should absorb the product of a greatly increased fishing industry in Lakes Albert and Edward. The need for fish proteins is medically apparent throughout Uganda and, except in Toro, that need is accompanied by a fairly active public demand. Moreover, with the passage into law of the new Employment Ordinance, employers of labour will in practice be compelled to provide their labour with meat or fish, and dried fish is likely to be the cheaper way of satisfying this legal requirement. There is also the perhaps remote possibility of (*a*) dehydrating fish for export, (*b*) canning the *ningu*, which is akin to a large sardine and is rightly regarded as a great delicacy by the African population, and (*c*) the production on a commercial basis of fish oil and fish meal.

The use of the Ripon or the Owen Falls as a source of hydro-electric power has already been the subject of expert examination and favourable report, and is shortly to be re-examined by a technical commission which is about to visit East Africa. This project, if it materialises, should encourage the grouping and possibly the expansion of secondary industries in the neighbourhood of Jinja.

What is the prospect of the establishment of new or the expansion of existing secondary industries in Uganda? At the beginning of these notes I have limited this prospect to secondary industries dependent on the soil and waters of Uganda and their products, and I see no good reason to qualify this limitation. Without adequate fuel, without cheap and efficient means of transport to the sea, and without an intelligent and industrious population, there can surely be no prospect of establishing any of the heavy industries in Uganda nor any of the secondary industries that serve and supplement the heavy industries in Europe and America, nor any industries that depend upon a high degree of skill or craftsmanship in their labour force. But there are a number of secondary industries, mainly of the processing variety, that benefit from proximity to the source of their raw material, and this is particularly true where the bulk of the finished product is much less than that

of the raw material. Examples of this can be found already in Uganda in the cotton ginneries and coffee hulling factories. Where climatic conditions favourable to processing co-exist with sources of supply, as is the case in the small tobacco industry of Uganda, this tendency to locate secondary industries in the producing country is strengthened, as it is also in the case of industries in which machinery can largely be used to reduce dependence on inefficient local labour.

But there are not many of these secondary industries that are not already operating in Uganda today. That many of them are inefficiently operated at present is obvious to the most inexpert observer, and these must be given every encouragement and stimulus to improve their plant and their technique. Their present inefficiency is a drag on the economy of Uganda. But for the most part these undertakings are not capable of expansion unless the crop which provides their raw material also expands, and with it the absorptive capacity of world markets.

The establishment in Uganda of two new industries of some magnitude is now under active consideration. First of these is to be a cotton-seed oil expressing plant to be operated by Messrs. Lever Brothers Limited at Kampala, for the manufacture of soap, edible oil, cattle cake and linters; the second is to be a large factory for the production of cotton piece goods to be established at Jinja. The latter will not be practicable unless cheap power is provided by a hydro-electric plant. Both these enterprises, if they materialise, will be on a large scale and may be expected to benefit the economy of the country, although both will have an adverse effect on Customs Revenue. There seems to be, however, little prospect of the establishment of other new industries on a similar scale, with the possible exception already mentioned of a cement industry in Toro. But there should be a future for a number of minor industries aimed at satisfying purely local demand.

As has been pointed out already in these notes, Uganda suffers from being at the end of a long and straggling railway system. Can anything be done about it? The answer is, I am afraid, precious little. The worst divagations of alignment such as that between Tororo and Kampala could no doubt be remedied at substantial capital cost, and a more scientifically designed tariff could be devised and applied; but the hard fact remains that exports from Uganda will, so far as can be foreseen, have to continue to travel more than 850 miles by rail before they can be shipped to overseas markets. This fact naturally limits the type of cash crops to be grown and the type of export goods produced to those which are capable of bearing this inevitably heavy cost of transport. But although comparatively little can be done to cheapen and improve communications with the coast, a good deal can be done to improve internal road communications which today directly or indirectly impose an appreciable tax upon the profits of production. To this end an ambitious road programme has been drawn up which aims at greatly improving both the surface and the alignment of the existing main road system of Uganda.

A secondary industry which has hitherto been neglected, and which if properly developed and organised might bring substantial benefit to Uganda, is the tourist industry. Uganda has many obvious attractions for tourists—unrivalled scenery, a profusion of "photogenic" wild game, and a temperate climate. At present it lacks good roads and comfortable hotels. Both these deficiencies can be made good, and as regards hotels steps to improve the unsatisfactory accommodation now provided for travellers are already in train.

I have now sketched out a few lines of possible development, but these suggested lines—and doubtless there are others—cannot be successfully followed without the willing and effective co-operation of the people of the country. All efforts for progress and prosperity can be largely neutralised by passive resistance, by ignorance and by inertia. This is where the Medical and Education Departments must play their part, assisted by the new Department of Public Relations and Social Welfare, for disease and ignorance are in Uganda two great obstacles to human progress. This aspect was, I consider, given too great a financial emphasis in Uganda's Post-War Development Plan. Unfortunately a country can only have in the long run the social services that it can pay for, and in their natural enthusiasm to spread health and education throughout Uganda the committee charged with the preparation of the development plan allowed themselves to be led

into recommendations for expansion of services far beyond the foreseeable financial resources of the Protectorate. Health and education ultimately produce rich dividends but they are delayed, long-range dividends and meanwhile national bankruptcy would have supervened. It is no good starting off on a journey in a Rolls-Royce with only enough petrol for a Ford "Ten".

That a great expansion of health and education services is eminently desirable is beyond question, and that such an expansion will in due course become financially practicable one can be reasonably confident; but meanwhile the revenue for that expansion does not exist and, failing large additional taxation which is not practicable at present, our only course is to press on with the production of national wealth and meanwhile to restrict the expansion of social services within the limits imposed by the funds that can be made available. But although the social services cannot be allowed to outrun the constable that does not mean that they are to stagnate. The progress will be rather slower than was originally contemplated but the end will be the same. It is a question not of policy but of pace.

With this general object in mind, an attempt has been made to work out what the average revenue of the Protectorate is likely to be during the next ten years, and provisional allocations from that revenue have been made to the Medical and Education Departments so that they can frame revised and more realistic plans of development. In framing their revised plans, both Departments have been encouraged to seek and apply every practicable means of giving the best service to the greatest number at the lowest possible cost; to employ if necessary slightly unorthodox methods if these are likely to achieve economy without seriously impairing performance, and if need be to accept a temporary lowering of standards in order to achieve this purpose. Such a lowering of standards would indeed seem particularly justifiable in the matter of building construction where a cheaper medium than bricks and cement is being sought by experiment and must be found. Everybody would like to see hospitals and schools which compare favourably with the more up-to-date functional buildings in England or America; but one is apt to forget that England did not attain to these standards except after centuries of toil and sweat and enterprise. East Africa, at the beginning of the road, cannot expect to have all those amenities ready made and without effort. They have got to be earned.

Both departments are now re-examining their plans from this angle and are not unhopeful of devising more economical methods of operation in certain fields. The Medical Department is also examining the possibility of placing an increasing emphasis on preventive rather than curative measures. Too much money is being spent today on curing men of diseases which they must inevitably contract again directly they are discharged from hospital. This is of humanitarian but of little economic value. The focus of infection must be eradicated rather than the disease which it causes.

The Medical and Education Departments should receive great help from the proposed Public Relations and Social Welfare Department. But apart from that Department's function of disseminating through its mobile demonstration teams agricultural, health and educational propaganda, and apart from its purpose as a two-ways news service between Government and the people, the department will have the very difficult and vital task of keeping in touch with the educated and semi-educated youth of the country and directing their thoughts and aspirations along healthy channels; in effect, taking over where the Education Department stops. I have described this task as vital because on its success or failure must largely depend the social and political future of Uganda. If we succeed, we may hope to have in Uganda a friendly, co-operative and progressive people, bound to Britain by ties of gratitude and common purpose. If we fail, then the progress of Uganda will inevitably be retarded and her future, social, political and economic, will indeed be black.

J. HATHORN HALL

18TH APRIL, 1946.

A Development Plan for Uganda

By E. B. WORTHINGTON

DECEMBER, 1946

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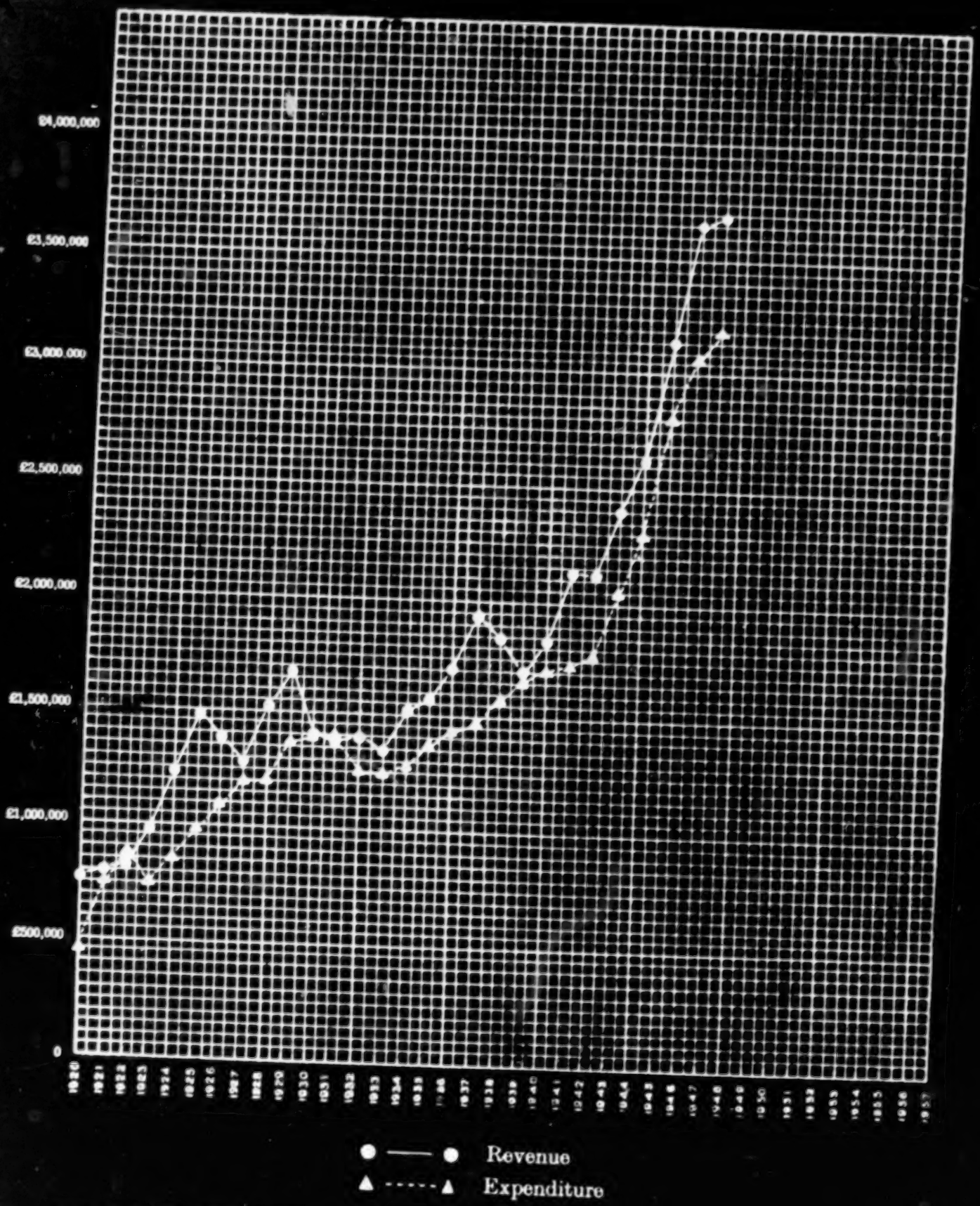

FIGURE 1.—GROWTH OF "ORDINARY" REVENUE AND RECURRENT EXPENDITURE SINCE 1920

The information was supplied by the Financial Secretary. Points for 1946 are revised estimates; those for 1947 are preliminary estimates.

A DEVELOPMENT PLAN FOR UGANDA

By E. B. WORTHINGTON

I. INTRODUCTION

1. The development of Uganda is not new. It commenced with the explorers and early missionaries, and received its first main impetus when the British Government accepted responsibility for the Protectorate in 1893. Since then development has been continuous, and its pace has accelerated. During the past 25 years annual revenue, and consequently expenditure on public services, has increased from less than £1,000,000 to more than £3,000,000 (*see* Figure 1).

2. It is estimated that Uganda's own revenue and accumulated funds will allow expenditure on public services amounting to about £40,000,000 during the next ten years. To this can be added £2,500,000 from British taxpayers as Uganda's allocation under the Colonial Development and Welfare Act of 1945. These figures are mentioned in order to emphasise that this is primarily Uganda's own development plan, and not something superimposed from above. If accepted in whole or in part, its successful achievement will require not only the participation of every public servant, but also of all races and sections of the community.

3. The plan is mainly concerned with the expenditure of public funds, but the large expansion of public services for which financial provision is made will be of little avail in helping the country towards increased prosperity unless there is a corresponding increase in the activity of private enterprise on the part of Africans as well as of Europeans and Asians. By providing services like improved communications, water supplies and housing schemes, and by furthering the development of hydro-electric power, it is hoped that a number of factors which have limited private enterprise up to date will be removed. Special opportunities may develop in the marketing and distribution as well as in the processing of primary products. Moreover, enterprise will be directly encouraged because large parts of the proposed expenditure are devoted to public works, many of which are suitable for placing out to contract.

4. A development plan is not a blue-print setting out the dimensions of a new structure. It should be regarded rather as a designer's preliminary sketches. Therefore this plan should not persist as the basis for development for more than the next two or three years without revision. Some of the projects must certainly proceed at all costs, but the rate of change grows as new discoveries are made and new experience is gained. Moreover, since the main factor limiting development is revenue, a new forecast made in a few years' time may increase the number of new measures which can safely be undertaken or, if there is a post-war slump, measures may have to be postponed. If a development plan is not worth revising it is not worth preparing.

5. A number of Colonial development plans from other territories have been examined with the object of taking advantage of good features and avoiding pitfalls. In consequence the method of presentation of this Uganda plan is somewhat different from others. I do not claim that it is ideal, but at least it explains within reasonable compass the objects, and how they and the means by which they may be achieved relate to the steady development of public services, and how development measures may be absorbed into the general framework of Government finance at the end of the decennium.

6. In the financial tables nearly all detail is avoided. This is for two reasons : firstly in order to avoid a common failing of detracting attention from the main objects of expenditure ; secondly because there are so many unknown variables, such as the purchasing power of Sterling and the availability of staff, that the expenditure of time and print in presenting detailed plans for more than one or two years ahead is largely waste. Much of the detail involved in reaching figures included in the tables is available, however, in departmental files. No attempt has been made to assess

priorities within the framework of the expenditure proposed. This is of great importance, but is a matter for settlement by the departments concerned in consultation with the Central Government after the general framework has been accepted.

7. My work as development adviser to the Uganda Government has lasted from May to December of 1946, but since this period included two visits to England, partly devoted to other matters, the work in Uganda has been crammed into less than four months. Consequently, it has not been possible to examine all the country, but every district has been toured. At all places visited problems have been discussed with officials of the Government and with unofficial members of the community.

8. My task has been eased by the relatively good documentation which the Protectorate enjoys. Uganda has the best Handbook which I know concerning any Colony, edited by Thomas and Scott (1935). It also has the admirable volume on Agriculture by Tothill (1940). Much work has already been devoted to future development by the Standing Finance Committee and the Development and Welfare Committee, which completed their joint report on post-war development in May, 1944, a year before the enactment of the Colonial Development and Welfare Act of 1945. In compliance with the principle in paragraph 4, this new development plan may be regarded to some extent as a revision of the earlier one, and it incorporates all those schemes which have already received financial approval. Finally, in April, 1946, His Excellency Sir John Hall produced his "Notes on the Economic Development of Uganda", which were of special value to me in understanding the main problems, and which appear as a foreword to this report.

9. The Secretary of State is anxious that there should be in every colonial territory a Development and Welfare Committee, including representatives of the unofficial community as well as of Government. I suggest that in Uganda this committee should be small in size, and its membership should be similar to that of the Standing Finance Committee with the addition of certain heads of departments. There must be a senior officer of the Secretariat as Development Secretary, with such authority as will ensure action in carrying out and co-ordinating development measures. Perhaps the title Development Commissioner more clearly indicates the status envisaged for this post. He should be absolved from other executive functions as far as possible in order to spend a good part of his time reviewing and stimulating developments wherever and however they may be undertaken. Only by such means can the plan be maintained as a whole with all sections of the community and all departments of government co-operating towards a common object.

10. Few of the proposals and ideas advanced in the following chapters are original. Most of them emanate from those who have thought about the problems for years, and I thank all those, officials and unofficials, who have so willingly imparted information and have given me the benefit of their long experience, and also those who have provided hospitality in many parts of the country. It is impossible to name individually all who have assisted in such ways, but I wish to express personal thanks to His Excellency Sir John Hall, The Hon. G. N. Farquhar, Chief Secretary, The Hon. H. S. Potter, Financial Secretary, all heads of departments, Provincial and District Commissioners, and especially Mr. F. J. Lattin, Acting Development Secretary, who has collaborated throughout in the field and in the office.

11. The fact that I have received much help in no way commits heads of departments or others to agreement with financial allocations or opinions expressed in any part of this report.

II. THE FUNDAMENTAL PROBLEM

12. The greatest service which could be rendered to the colonies would be to make them capable of maintaining a steadily increasing standard of living and expanding public services without need to call for outside assistance. Since the standard of living cannot rise unless the income of the individual family rises, and public services cannot expand unless revenue is buoyant, the first aim of development must be to cause production in all its forms to increase at a greater rate than population.

13. There are tragic lessons to be learned from other parts of the world which have already passed through the stage of development which we see today in Uganda. In Egypt the population of about 17,000,000 is now increasing at a rate which is likely to double the number of people in, perhaps, 50 years, whereas nearly all the cultivable land is already used. Much the same is happening in India with its 400,000,000 people, but on a vaster scale. In both these countries, and in many others, the rate of increase in population is still accelerating, and it seems impossible for the increase of production to keep pace without a great concentration on secondary industries at the expense of agriculture. As a result, the standard of living is tending to fall, famines are a constant danger, and the average expectation of life is less than 30 years, compared with over 60 years in Great Britain. There were a few far-seeing men in these countries half a century ago who appreciated the biological and political problems which were about to develop, but only now are strenuous efforts being made to redress the balance by concentrating the resources of modern science to bear on the fundamental problem of balance between production and population.

14. The sequence of events which has taken place in India and Egypt must be avoided at all costs in East Africa. But already there are signs that the factors which have caused them are taking their course. The population of East Africa as a whole is increasing, and the rate of increase is probably quickening every year, whereas the region is already incapable of feeding itself. In certain areas, such as the Kikuyu and Wakamba reserves in Kenya and parts of Tanganyika, very serious inroads have already been made into the fertility of the soil.

15. Uganda may be in a better position to face the future than other territories in the region because, relative to population, it is better provided with undeveloped fertile land and water. Concerning population the census of 1911 gave the total as 2,693,325 ; that of 1931 gave 3,584,758 ; while in 1944 the total population was estimated at 3,956,654. These figures may be in error by at least 5% either way, but they suggest that as a whole the population is capable of large increase and that the curve is about to start on an upward surge. The total figures are made up from a large number of component populations, some of which are known to be increasing rapidly, others to be reducing. Thus the Bakiga people of Kigezi District have doubled their number in 30 years, those of Mubende District have achieved a similar increase. Allowing for the fact that part of these increases has been caused by immigration, the rates are considerable and may be exceeded in future. On the other hand, it is probable that the Bahima cattle owners of Ankole and Masaka Districts are reducing in numbers. The same probably applies to the cultivators of Toro District, while the people of Bunyoro are said to have been reduced from about 200,000 to 100,000 between 1906 and 1925, since when they show a slight tendency to increase.

16. Looking to the future it must be assumed that the entire population of Uganda will increase rapidly with the possible exception of the cattle folk. Ignorance concerning the probable trends is lamentable, and must remain so until the study of population and vital statistics is based on a proper foundation. Meanwhile it is necessary to make a guess as a basis for planning. After consulting Dr. R. R. Kuszinski and other experts, I guess that the population of the whole territory

will increase by about 50% to a total of about 6,000,000 during the next 30 years. By then the infant mortality and general death rates will have been reduced and the expectation of life increased. Moreover, it is likely that immigration from more densely populated countries adjoining Uganda will be much greater than at present. It must be assumed, therefore, that the rate of increase 30 years hence will be considerably greater than that today, and we should look forward to a population of about 10,000,000 half a century hence.

17. The total area of Uganda, excluding water, swamps and game reserves, is about 75,000 square miles. Of this, at least one-tenth should be maintained as permanent forest and part of the remainder is unproductive rocky land, so there are perhaps 65,000 square miles fit for agricultural occupation. If it is assumed that 50 years hence 15% of the population will be engaged in industrial production, commerce, fisheries and forestry, then the population living directly off the 65,000 square miles of land available for agriculture would have an average density of about 130 per square mile. On the basis of five persons per family, each family holding would average less than 25 acres. Opinions as to the size of satisfactory holdings for economic agriculture in Uganda vary widely. At present, with cultivation almost entirely by hoe, the holdings are very small, averaging not more than four acres excluding grazing land, in the long-grass country, which is the most productive and best watered part of the Protectorate, and perhaps two or three times as much in the less productive parts of the short-grass country. Taking account of the need for grazing land and grass leys to maintain fertility, and the probability that the system of cultivation will be much improved by mechanical assistance, it seems that we should look forward to an average holding in the Protectorate as a whole of 25 acres* 50 years hence as the very minimum required to support the much higher standard of living which should then prevail. Therefore, on the above guess of population increase, it seems that the productive capacity of the soil of Uganda will be used to its fullest extent 50 years hence. Thereafter, if over-population is to be avoided, it will be necessary for the factors which lead to stabilisation of population to have their effect. These factors are as yet little understood, but all of them depend on an increase in the standard of living, and experience in other countries suggests that they require at least two generations to operate

18. With these considerations in mind a provisional time-scale can be drawn up for the future development of Uganda. During the next ten years, while maintaining steady improvements to social services, the prime object should be a concentration on productive effort to ensure that production increases rapidly, at a rate much higher than population. At the end of that period, assuming this object is achieved, the way would be open for establishing greatly improved social services, including health and education, which in the early stages tend to accelerate the rate of increase of a population, but in advanced stages tend to cause stabilisation. On the basis of the above guesses, there would then be 40 years, that is about two African generations, for the factors to operate in such a way as to retard the rate of increase and to give a population stabilised at about 10,000,000 people, who would use all the natural resources.

19. In the meantime, focussing attention on the next ten years, the greatest asset of Uganda is not man-power, because many tribes in the country leave much to be desired as workers, but the large expanse of land and water which has not yet been brought into production. Thus the fundamental problem divides itself into two parts, first how to increase the output per head of African, and second how to remove the handicaps which render large areas unused or unuseable, and to ascertain how those areas could be developed in the best interests of the inhabitants when there is more man-power available. If tsetse flies are overcome and lack of water is made good before a logical system of using the reclaimed areas has been worked out and tried out in practice, a great opportunity for improving the future lot of the African will have been lost.

20. Whether or not the big increase in production, which I regard as essential, can be achieved by following the policy of progress by example and persuasion, is an open question. Many people

* The size of the average holding will, of course, vary greatly in different parts of the country, but data are as yet insufficient to assess the area required in detail.

who have thought about the problem are of opinion that it is not possible, and that within ten years it will be necessary to introduce a degree of compulsion equal, perhaps, to that applied in Great Britain today.

21. The main factors which limit efforts to increase production seem to be the following :—

(i) lack of fundamental information about the country ;

(ii) a system of agriculture inherited from the past and incompatible with the full use of natural resources ;

(iii) the low capacity of the African for physical and (less important for the time being) mental work, coupled with a lack of desire for economic or social advancement ;

(iv) power based on the most inefficient of fuels, namely wood.

Factor (i), the lack of basic information, is a limiting factor to which I attach great importance ; it is not considered as a separate issue, but pervades the whole plan and leads to a number of development measures including research and investigation in all its forms. Much of this is being arranged on an interterritorial basis, financed in part by Colonial Development and Welfare Central Research funds. Factors (ii), (iii) and (iv) are included in the main headings under which this plan is presented, namely, Productive, Social and Common Services. Under (iii), the lack of desire for advancement can be overcome in part by a much greater provision of consumer goods, a matter which can best be pursued on an interterritorial basis and is beyond the scope of this plan.

22. With the funds available it is impossible to tackle all the problems in equal degree throughout the country. If this is attempted there will be danger that a large part of the effort may be frittered away without lasting benefits, and without providing the information which will be required to make a more ambitious plan in ten years' time. Therefore, as an important and integral part of the work required to solve the fundamental problem, one or more special schemes are proposed for intensive effort in limited areas. These are described as "pilot schemes", because they are the places selected for trial and error and, if successful, will show the way by which other parts of the Protectorate could be developed fully when more money and more man-power are available.

III. FINANCE

23. Before deciding what development measures to include in the plan, I have found it necessary firstly to ascertain the total funds available for expenditure during the next ten years, in so far as a forecast can be made, and secondly to analyse and to estimate roughly the whole of Government expenditure during that period, including both normal expansion of public services and special development measures. Accordingly Table 1, which summarises all financial provisions, includes several columns in addition to the development plan itself. I have been vigorously criticised for attempting such an analysis, which is not usually regarded as part of the duties of a development adviser, but since it was necessary in preparing the plan it may be helpful in its presentation. Reasoned guesses have been made in many cases where the Financial Secretary himself would probably be unwilling to express opinions, but they have been necessary in order to link the development plan to the general framework of public finance. In particular, the forecast for 1957 is in no sense intended to be an estimate of the budget for that year, which would manifestly be impossible. It is included merely to demonstrate that the development plan is likely to be within the capacity of the country's revenue when the decennium is complete.

24. *Funds available for development.*—The following funds are estimated to be available during 1947–1956 for all expenditure above the 1946 level of recurrent charges as shewn in the 1946 Estimates:—

		£	£
A.	*Revenue:*		
	Ten years averaged at £3,500,000	35,000,000	
	Less ten times recurrent expenditure of £2,840,000 per annum being 1946 level	28,400,000	
			6,600,000
B.	*Surplus balances:*		
	As at 31st December, 1946	2,398,000	
	Less fixed reserve	1,000,000	
			1,398,000
C.	*Cotton and Hard Coffee Control Fund*		2,500,000
D.	*Cotton and Hard Coffee Control profits from 1946–1947*		1,000,000
E.	*New loans (other than for hydro-electric power)*		2,000,000
F.	*Colonial Development and Welfare (Uganda allocation)*		2,500,000
			£15,998,000
		Say:	£16,000,000

25. This paragraph explains the above list.

A. *Revenue**.—In April 1946 the Financial Secretary estimated that the average revenue exclusive of reimbursements, in 1947–1956 is likely to be not less than £3,500,000. Sir Wilfrid Woods (Report on a Fiscal Survey of Kenya, Uganda, Tanganyika, August 1946, para. 284) made an independent estimate of Uganda's revenue for the five years 1947–1951 of £3,220,000, to which must be added two items, for rebate of tax – £195,310, and railway debt charges – £52,974, in order to be directly comparable with the Financial Secretary's estimate. At a meeting with Sir Wilfrid Woods and the Financial Secretary held on 24th August, 1946, it was decided that although the two estimates are for different periods the difference between them is so small as to be insignificant, and that in view of the steep rise in revenue during the past 20 years (Figure 1) an estimate of £3,500,000 for the next ten years can be taken as a conservative figure for the purposes of

* See Postscript, para. 415.

Table 1.—Financial Provisions of the Development Plan Related to General Public Expenditure

Subject	1946 Recurrent		Normal Expansion 1947–1956 Average annual recurrent additional to 1946	Development Schemes 1947–1956 Average annual recurrent during 10 years	Development Schemes 1947–1956 Non-recurrent Total in 10 years	Total 1947–1956 Normal expansion plus development schemes [cols. 3 (×10) +4 (×10) + 5]		Forecast for 1957 Annual Recurrent Expenditure Residual from normal expansion	Residual from development schemes	Total recurrent [columns 2+7+8]		1957 Anticipated Revenue from Development Schemes
1	2		3	4	5	6		7	8	9		10
Productive Services	£	%	£	£	£	£	%	£	£	£	%	£
1. Meteorology	4,600	0·2	..	6,000	5,000	65,000	0·4	..	7,400	12,000	0·3	..
2. Geology	12,000	0·4	500	3,500	15,000	55,000	0·3	800	4,000	16,800	0·4	..
3. Hydrology	..	..	..	4,000	20,000	60,000	0·4	..	5,000	5,000	0·1	..
4. Water Supplies	5,000	0·2	..	18,000	397,500	577,500	3·6	..	21,200	26,200	0·7	6,000
5. Surv., L. & Mines	42,200	1·5	1,000	21,500	22,500	247,500	1·5	1,500	38,700	82,400	2·2	11,000
6. Biological Survey	..	..	..	1,000	..	10,000	0·1	..	1,300	1,300	..	..
7. Tsetse Control	38,000	1·3	..	13,000	250,000	380,000	2·4	..	20,000	58,000	1·5	..
8. Agriculture	113,300	4·0	5,000	35,000	455,000	855,000	5·3	7,000	54,000	174,300	4·6	12,000
9. Animal Industry	37,600	1·3	1,000	13,600	66,000	212,000	1·3	1,500	21,200	60,300	1·6	2,000
10. Forestry	38,400	1·3	6,600	4,800	91,500	205,500	1·3	10,000	7,000	55,400	1·5	11,000
11. Fisheries	100	..	..	8,800	40,500	128,500	0·8	..	12,500	12,600	0·3	..
12. Game	9,300	0·3	1,000	..	2,000	12,000	0·1	1,500	..	10,800	0·3	..
13. Swamp Devlpmt.	..	..	..	..	100,000	100,000	1·6	..	..	..	..	..
14. Co-op. Societies	300	..	..	10,000	70,500	170,500	0·1	..	13,000	13,300	0·4	2,500
15. Secondary Inds.	4,600	0·2	200	..	..	2,000	..	400	..	5,000	0·1	..
Totals	305,400	10·7	15,300	139,200	1,535,500	3,080,500	19·2	22,700	205,300	533,400	14·0	44,500
Social Services												
1. Health	376,500	13·3	15,000	34,500	1,005,000	1,500,000	9·4	20,000	55,000	451,500	11·8	..
2. Education	326,800	11·5	60,000	60,000	300,000	1,500,000	9·4	110,000	90,000	526,800	13·8	..
3. Public R. & S.W.	27,700	1·0	..	7,300	100,000	173,000	1·1	..	12,300	40,000	1·1	..
4. Uganda Museum	800	..	..	3,000	30,000	60,000	0·4	..	4,000	4,800	0·1	..
5. Labour	13,000	0·4	400	9,000	66,000	160,000	1·0	500	12,000	25,500	0·7	1,000
6. Prisons	58,700	2·1	1,000	2,000	125,000	155,000	0·9	1,500	2,500	62,700	1·6	..
7. Approved Schools	..	..	..	3,000	15,000	45,000	0·3	..	5,000	5,000	0·1	..
Totals	803,500	28·3	76,400	118,800	1,641,000	3,593,000	22·5	132,000	180,800	1,116,300	29·2	1,000
Common Services												
1. (a) Administration	503,200											
(b) Law	27,700	22·4	30,000	7,000	400,000	770,000	4·8	50,000	10,000	695,300	18·2	..
(c) Defence	104,400											
2. Police	111,400	3·9	7,000	..	200,000	270,000	1·7	10,000	..	121,400	3·2	..
3. Statistics	2,600	0·1	..	4,000	15,000	55,000	0·3	..	5,000	7,600	0·2	..
4. Transport:												
(a) Water	..	..	..	..	..	..	..	..	..	..	..	..
(b) Rail	..	..	..	..	..	..	..	..	..	..	..	..
(c) Roads	117,600	4·2	15,000	4,000	819,000	1,009,000	6·3	20,000	12,700	150,300	3·9	..
(d) Air	13,700	0·5	1,000	3,000	200,000	240,000	1·5	2,000	4,000	19,700	0·5	1,000
Posts and Tels	88,300	3·1	1,000	18,900	232,000	431,000	2·7	2,000	27,000	117,300	3·1	28,500
Hydro-electric	..	..	..	..	..	..	..	..	..	..	..	..
Urban Devlpmt	55,100	2·0	5,000	50,000	1,500,000	2,050,000	12·8	7,000	60,000	122,100	3·2	15,000
Housing Govt staff	..	..	..	..	500,000	500,000	3·1	..	..	..	..	15,000
African housing	..	..	..	..	500,000	500,000	3·1	..	..	..	..	5,000
Govt bldgs maint.	29,200	1·0	..	14,400	..	144,000	0·9	..	28,700	57,900	1·5	..
P.W.D. General	114,300	4·0	2,000	1,000	350,000	380,000	2·4	3,000	1,500	118,800	3·1	..
Printing	17,600	0·6	1,000	4,000	60,000	110,000	0·7	1,500	6,000	25,100	0·7	..
Tourism, N.P. & H.	..	..	..	..	50,000	50,000	0·3	..	..	..	..	..
Cost of living allcs	200,000	7·0	30,000	..	..	300,000	1·9	50,000	..	250,000	6·6	..
Pensions & Grats	162,300	5·7	30,000	10,000	..	400,000	2·5	30,000	15,000	207,300	5·4	..
Public Debt	183,700	6·5	..	30,000	..	300,000	1·9	..	60,000	243,700	6·4	..
Emerg. & Sp. Ex	..	..	..	..	..	..	..	..	..	..	..	..
Totals	1,731,100	61·0	122,000	146,300	4,826,000	7,509,000	46·9	175,500	229,900	2,136,300	56·0	64,500
Special Developments												
Pilot Schemes	..	..	..	50,000	500,000	1,000,000	6·2	..	20,000	20,000	0·5	30,000
Karamoja District	..	..	..	8,000	105,000	185,000	1·2	..	11,000	11,000	0·3	..
Totals	..	..	..	58,000	605,000	1,185,000	7·4	..	31,000	31,000	0·8	30,000
Reserve Fund	..	..	..	..	632,500	632,500	4·0	..	..	..	..	..
GRAND TOTAL	2,840,000	100·0	213,700	462,300	9,240,000	16,000,000	100·0	330,200	647,000	3,817,200	100·0	140,000

development planning. It was further agreed that it is not unreasonable to assume a revenue of £4,000,000 in 1957 and that if the purchasing power of Sterling alters much before that time, revenue may be expected to alter in like proportion.

B. *Surplus Balances.*—It has been accepted that a fixed reserve of £1,000,000 will be adequate during the next ten years, so that the balance of £1,398,000 is available for expenditure.

C. *Cotton and Hard Coffee Control Fund.*—The Cotton and Hard Coffee Fund accumulated during the war amounted to more than £5,000,000 by the end of 1946. It is understood that about one-half of this fund is likely to be required as a permanent fund for the purpose of stabilising prices. The remainder (£2,500,000) is assumed to be available for development, but under present arrangements its use is circumscribed by undertakings already given.

D. *Cotton and Hard Coffee Control Profits.*—The profits from cotton and hard coffee control on the crop of 1946–1947 will be available for expenditure. It is estimated that they will amount to at least £1,000,000.

E. *New Loans.*—It is proposed that a new loan amounting to £2,000,000 should be raised during the next ten years. It will be expended mainly for urban development and other services involving high capital cost but chiefly of a self-reimbursing kind. It is assumed that the loan will not be raised all at once, nor will it be required in the early years of the decennium, so that provision is made in Table 1 for interest and amortization at 3% per annum for five out of the ten years. This loan is not intended to cover hydro-electric developments described in paragraph 269, which are regarded as an issue separate from the Uganda plan.

F. *Colonial Development and Welfare Vote.*—The allocation to Uganda is £2,500,000, according to the enclosure to the Secretary of State's Circular Despatch of 12th November, 1945. Of this amount, schemes to the total of £1,511,850 have already been approved and expenditure on some of them has started. All Colonial Development and Welfare schemes already approved are included in Table 1, columns 4 and 5, whether or not expenditure has commenced.

26. In addition to the Uganda allocation from the Colonial Development and Welfare vote, an allocation of £3,500,000 has been made to the East African region for projects which will benefit all the East African territories. Such joint projects are mentioned from time to time in this report, but are not included in the financial provisions if they appear suitable for financing from the regional vote.

27. This paragraph explains the arrangement of columns in Table 1 (page 11).

A. *Column 1* is a list of subjects in the order adopted for this report.

B. *Column 2* shows the estimated recurrent expenditure in 1946 which is taken as a datum line. It is analysed into categories which correspond with the heads under which the plan is presented. The grand total (£2,840,000) does not equal the total of recurrent expenditure shown in the 1946 Estimates (£3,004,008—see Financial Statement, page 3 of published Estimates) because a large amount for Emergency Services was included in the latter. Part of this, which is likely to be recurrent, has been absorbed into other headings in the development plan. Much of the balance is spent on training ex-soldiers and on war-time controls, and therefore is likely to disappear within a few years. "Extraordinary" and "Special" expenditure, that is, capital on buildings, public works and other non-recurrent items, are as far as possible intended to be completely absorbed for the period 1947–1956 into development schemes, and therefore are provided for in column 5.

C. In *column 3* an allocation for normal expansion of recurrent expenditure during 1947–1956 is entered against each head where it applies, the entries being the average annual expenditure in addition to the 1946 level. The amounts are relatively small because they are generally intended to cover only the increased cost of maintaining activities at their present level and not to provide increases in either staff or services. A department such as Education has a large entry because it is responsible for the salaries of a large number of African teachers mostly on the lower rungs of the ladder and will have few retirements. Labour, on the other hand, has a very small entry because increments for the existing staff are expected mostly to be balanced by retirements. An entry for cost of living allowances and salary adjustments comes into column 3 because it will apply to staff already employed. It will be appreciated that normal expansion, as interpreted here, is in no way comparable to the expansion of recurrent expenditure which has occurred during, say, the last ten years.

D. *Column 4* includes recurrent expenditure on development measures, expressed in the same form as column 3. It includes new staff, required for an existing service or for establishing a new service, and

other recurrent charges incurred in the activities of departments. The separation of entries into columns 3 and 4 is in some cases arbitrary, and in practice the two would often be taken together as a basis for comparison with annual estimates. In April, 1946, a scheme of allocations for new recurrent expenditure of departments for the period 1947–1956 was issued in Secretariat Circular Memorandum No. 17. Provisions in this plan in columns 3 and 4 together are in all cases greater than in Circular Memorandum No. 17, except for Health and Civil Aviation. Health would be considerably greater except for the fact that several activities are classed for the time being as involving non-recurrent expenditure only, and are therefore included in the entry in column 5. Included also in column 4 is recurrent expenditure which will be incurred as a result of development measures although it does not itself constitute development. Examples are Government buildings—maintenance, Pensions and Gratuities for the enlarged Civil Service envisaged, many of whom may leave the service before the end of the decennium, and an enlarged Public Debt consequent on floating a new loan.

E. *Column 5* includes all non-recurrent expenditure during the whole 10-year period. This incorporates all forseeable capital expenditure and also other "Extraordinary" expenditure, and "Special" expenditure. In some cases, for example, in P.W.D. General, it includes salaries and wages of staff employed on short-term contracts to accomplish schemes which are intended to be complete before the end of 1956.

F. *Column 6* shows the total expenditure in 1947–1956 which is additional to the 1946 level. The figures are therefore made up from those for normal expansion (column 3×10) plus the total for recurrent expenditure on development schemes (column 4×10) plus non-recurrent on development schemes (column 5). The grand total of column 6 therefore represents a rough estimate of all moneys available for expenditure during the next ten years, additional to the level of recurrent expenditure in 1946.

G. In deciding which development measures are justified during 1947–1956 a major factor is the residual recurrent expenditure at the end of that period. Therefore a very rough forecast for expenditure in 1957 is included in columns 7, 8 and 9. Column 7 is the residual expenditure from normal expansion, and since normal expansion is presumed to be progressive, the entries in column 7 are larger than those in column 3. If normal expansion were to continue at a steady rate through the ten years, column 7 would be twice column 3, and this may in fact occur if revenue is buoyant and allows it ; but the entries in column 7 are made on the assumption that normal expansion will be more rapid during the early years than later, and therefore entries in column 7 are usually about 50% more than those in column 3. The same principle is applied in recurrent expenditure on development schemes, so that the entries in column 8 are generally larger than those in column 4.

H. *Column 9* is the addition of columns 2, 7 and 8, that is, a guess at the total recurrent expenditure in 1957. It has been added in order to relate expenditure to probable revenue, looking ten years ahead, and to assess the general effect of the development schemes on total public services, when those schemes have been absorbed into the ordinary financial structure of Government. The grand total of this column (£3,815,200) is well within the estimated revenue for 1957 (£4,000,000—see para. 25 A) so that a balance should be available for extraordinary and special expenditure which by then will no longer be provided by special development funds.

I. Finally, in *column 10* are entered some rough figures for direct revenue which may be expected from particular development schemes. The total of £140,000 gives no indication of the increased revenue which is expected to result from the development plan as a whole, because most development measures are expected to result in indirect revenue which will come from a general increase in economic prosperity and taxable capacity. Revenue is expected from some of the development measures before the end of the ten years, but no estimate of this has been attempted.

28. In the body of the report the entries in Table 1 against a number of subjects are broken down in supplementary tables, in which the columns have been maintained exactly as in Table 1 with the omission of the % sub-columns. Thus the totals of each supplementary table equal the entries against that subject in Table 1. In all tables, figures for annual recurrent expenditure (columns 2, 3, 4, 7, 8 and 9) are rounded to the nearest £100, and non-recurrent expenditure (column 5), total for 1947–1956 (column 6) and revenue (column 10) are to the nearest £500. Tables 5, 12, 17 and 18 are exceptional and have a modified arrangement of columns because they deal with activities which were not properly established before 1947, but the totals equate with those in Table 1. All entries in supplementary tables are intended to be merely provisional

indications, not to be regarded as binding, if circumstances show the need for varying the expenditure.

29. In columns 5 and 6 of Table 1, a final entry of Reserve Fund is made, amounting to £632,500. This reserve is in fact the balance making the total of column 6 up to £16,000,000 (see para. 24) and is 4% of the total. The existence of a reserve is important because it is impossible to foresee the results of research and investigation which will be actively pursued by Uganda as well as by other agencies. At any time research may show new promising lines of approach to the many problems of development. The reserve is a provision for such eventualities and also for such special expenditure as is not otherwise provided for.

30. The general effect of the plan on the structure of Government expenditure is best indicated by the percentage figures which are added to columns 2, 6 and 9 of Table 1. Referring to the totals of the main divisions of subjects, Productive Services in 1946 accounted for 10·7% of all recurrent expenditure, a proportion which is increased to 14% in 1957 as a result of spending 19·2% of all funds available during the next ten years above the 1946 level. The proportion spent on Social Services remains almost the same, 28·3% in 1946 compared with 29·2% in 1957, while 22·5% of available funds are spent on them during the next ten years. Common Services reduces a little from 61% in 1946 to 56% in 1957. Special developments are new items to which 7·4% of available funds are allocated during the next ten years, resulting in a recurrent expenditure of 0·8% of the total in 1957, this being balanced by revenue expected from the schemes.

31. The proportion of moneys devoted to various branches of public service as represented in the percentage figures of column 9 represent, in my opinion, an improvement on those in column 2, but I am not satisfied that they are a correct apportionment for a country at Uganda's stage of development. It would be preferable to devote a still larger proportion of available money and effort to services aiming directly at production and less to social services. But social services once introduced cannot be reduced: they must indeed be increased at a rate more rapid than the increase of population, so that the service per head rises rather than falls.

32. Before deciding to present the plan in this form thought and discussion was devoted to the advantages and disadvantages of either binding the development plan into the general finances of Government from the beginning, or keeping it apart and separately financed according to the method adopted by the Kenya Government in their Development and Reconstruction Authority, which involves the creation of a double budget from 1947 onward. The main advantage of separate finance for development measures is that once the financial provisions have been agreed the schemes can be continued with less danger of serious interference. A disadvantage is that the separation tends to dissociate development measures from other public services of which they should be an integral part. It is appreciated that the D.A.R.A. method has special advantages in Kenya but in the somewhat different circumstances which obtain in Uganda it does not appear to be necessary.

33. The method which I have adopted has advantages of flexibility. The development measures are listed separately and individual schemes can be selected as suitable for financing in whole or in part from the various funds available, *e.g.* Colonial Development and Welfare vote, Cotton and Hard Coffee Funds, Loans or Revenue. A number of the schemes are already provided by approved allocations from the Colonial Development and Welfare vote. Many would appear suitable for financing from the Cotton and Hard Coffee Funds, because the main advantages would accrue to the areas from which cotton and hard coffee are produced. Certain grants amounting to £635,000 have already been recommended for expenditure from the Cotton Fund, but are included in columns 4 and 5 of Table 1. Suggestions for development measures suitable for loan finance are made in para. 303.

34. In the event of financial stringency arising from a post-war slump, development schemes which have not yet been started will have to be further postponed. Schemes planned in detail and already started would suffer so much from being pruned that every effort should be made to continue them in spite of temporary over-expenditure.

UGANDA PROTECTORATE

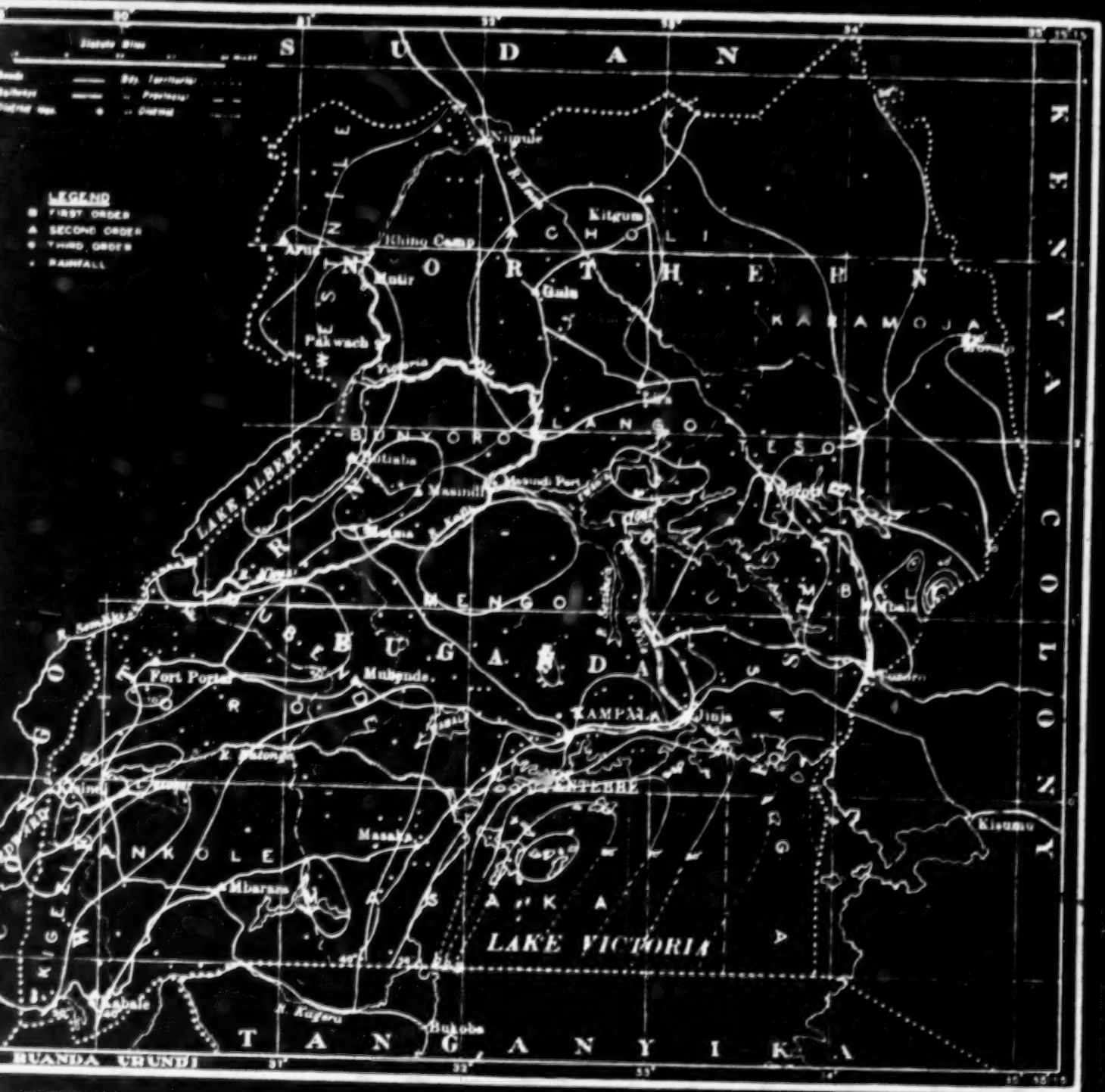

FIGURE 2.—RAINFALL AND METEOROLOGICAL STATIONS

The information, revised to November, 1946, was supplied by the East African Meteorological Office

IV. PRODUCTIVE SERVICES

35. Included in this chapter are subjects which are directly concerned with production. In some cases individual subjects overlap with social services so that distinction becomes arbitrary. For example, meteorology, water supplies and co-operative societies, which are included in this chapter, are necessary for both productive and social purposes. Sound arguments can be advanced, moreover, that a large part of health and education services is productive because the basis of increased production is harder work and this is often limited by poor health and lack of understanding. The argument could be taken a stage further, as it can be claimed with equal force that much of agriculture, animal industry and fisheries are of social service, because a larger and better balanced diet is a major factor in physical and mental development.

1. Meteorology

36. The collection and analysis of all meteorological records in East Africa is centralised in the East African Meteorological Service. It is financed by contributions from participating governments with a small contribution from Egypt in return for the records, particularly of rainfall, obtained in the drainage basin of the Nile. There is general agreement that the service must be expanded if it is to provide an adequate basis for aviation, agriculture, health and other developments for which records are required.

37. There may be considerable changes in the organisation in the near future in view of a proposal to create an Empire Meteorological Service responsible to the Air Ministry in London. It would presumably be organised in regional units of which East Africa would be one. An Empire-wide scheme, if adopted, is likely to place emphasis on those aspects of the subject which are of principle importance to air navigation, especially short-term forecasting. Desirable as this is, air navigation affects only the very few. In the development of backward countries the needs of meteorology are greater for purposes of agriculture, rural water supplies and the like, for which short term forecasting is of little or no value but for which a general assessment of climate is of great importance. In particular a big increase is required in the number of third-order and rainfall stations recording variables which can be measured by simple apparatus. This need is particularly great in Uganda where rainfall stations are few and ill-distributed as shown in Figure 2.

38. The siting of new recording stations and training of observers will require detailed study. The aim should, perhaps, be to establish rainfall stations not more than five miles apart throughout the more densely inhabited parts of the country and ten miles apart in the rest. This would involve multiplying the present number of rainfall stations in Uganda, about 600 in all, by more than ten times. At present all the recording of rainfall is done on a voluntary basis, mainly by Government officers, but it is doubtful whether the big increase of the service could be achieved without instituting small payments for those observers who are not otherwise employees of Government. The payment of premiums implies a definite contract and hence more reliable recording.

39. The collection of large numbers of records is of relatively little value unless there are facilities for their proper analysis so that results can be expressed in relation to other climatic factors, crop production, etc. The headquarters of the East African Meteorological Service are as yet inadequately provided to do this, even with the few existing records, so that an increase of central staff and of statistical machinery is required.

40. As to financing the expanded service, a large contribution to the cost of the Empire service may be expected from the Colonial Development and Welfare Vote held centrally at the Colonial Office. In addition, the project appears suitable for a contribution from the East African regional vote. Contributions from the separate territories will no doubt have to be increased also. The present annual contribution from Uganda is £4,600 (Table 1, column 2). Provision is made for an increased contribution of £6,000 in column 4, rising to £7,400 in column 8, so that the total contribution would be £12,000 at the end of ten years as entered in column 9. £5,000 is entered for new apparatus in column 5. These figures are merely my personal guesses after consulting the staff of the East African Meteorological Service, and cannot be ascertained until negotiations concerning the reorganisation of Empire meteorological services are more advanced. The entries are assumed to include the proper analysis of all records at an interterritorial headquarters.

41. If the other East African territories do not wish to participate in expanded service on an interterritorial basis, it is possible that Uganda may have to make its own arrangements with the East African Meteorological Office. It is understood that the Meteorological Office would be prepared to undertake any special work which may be required both in collecting and analysing records.

2. Geology

42. The establishment of a central Colonial geological service is being considered by the Colonial Office and will probably be financed entirely by Colonial Development and Welfare central funds. The effect of this may be that a large part of the work of territorial geological departments will in future become a function of the centrally controlled service, which is likely to operate through regional organisations. It is yet uncertain when this new scheme will be introduced, and therefore it is necessary to make provision for continuing the existing Geological Department in Uganda at full strength with expansion as necessary.

43. Any new developments of mineral resources may greatly improve the whole economic position of the Protectorate, and therefore it is desirable to leave no stone unturned in examining the country for new resources. Much excellent work has been achieved by the Geological Department since its inception in 1920, but there are still considerable areas which await detailed geological study and mineral prospecting before it can be said that no important mineral deposits await discovery. Moreover, some of those deposits which are already known require further examination to define their quality and extent. Among minerals already being produced for export are: tinstone, gold, apatite (phosphate rock), columbite and tantalite, mica, wolfram, bismuth, quartz crystal and beryl. Minerals found but not yet worked for export are: talc, asbestos, kyanite, graphite, copper, oil, lignite, gypsum, titanium ores, magnesite, iron ores, felspar, amblygonite (lithium phosphate) and various other products of local use, such as pottery clay, glass sands, and limestone, which go to Kenya in small quantities. Most of these deposits have so far proved to be small in extent, except for the copper at Kilembe on the slopes of Mount Ruwenzori, the limestone and clay suitable for cement manufacture at Mohokya nearby, and the phosphate rock near Tororo in Bugishu, where 5,000,000 tons occur in one locality alone to a depth of only 50 feet. The oil known to occur in the Lake Albert rift might be of great importance, but the existence of large quantities is doubtful because all known oilfields of large extent were once under the sea, whereas the Lake Albert deposits were not. For this reason large expenditure is not proposed on oil exploration until more preliminary results are available.

44. Assuming that the activities of the Geological Department in survey work will continue steadily during the next ten years, the chief development scheme envisaged is the addition to the department of a unit designed to speed up the process of mineral exploration.

45. This paragraph explains the entries in Table 2.

A. *Normal expenditure.*—The department is costing at present about £12,000 a year and provision for a small expansion averaging £500 a year for ten years is made in column 3, rising to £800 a year in column 7.

B. *Mineral exploitation.*—£3,500 a year (column 4), rising to £4,000 in column 8, is a new development scheme starting in 1947 to accelerate the study of minerals of economic value. It provides for new European staff, including a metallurgist who will work mainly at headquarters, and two overseers who will spend most of their time travelling. The entries provide also for the travelling, transport, leave, etc., of these officers.

C. *Additions to headquarters.*—£6,000 in column 5 will provide for a metallurgical laboratory and equipment, and a museum and equipment, also for additional offices at the headquarters of the department in Entebbe.

D. *Caravans.*—£4,000 in column 5 is required to equip the field officers of the department.

E. *Housing.*—£5,000 in column 5 provides two houses, one for the new metallurgist and one for a new overseer on mineral exploitation. It is assumed that the other overseer will live in a caravan.

TABLE 2.—GEOLOGY

Subject	1946 Recurrent	Normal Expansion 1947–1956	Development Schemes 1947–1956		Total 1947–1956	Forecast for 1957 Annual Recurrent Expenditure			1957 Anticipated Revenue from Development Schemes
		Average annual recurrent additional to 1946	Average annual recurrent during 10 years	Non-recurrent in 10 years	Normal expansion plus development schemes [cols. 3 (×10)+4 (×10)+5]	Residual from normal expansion	Residual from development schemes	Total recurrent [columns 2+7+8]	
1	2	3	4	5	6	7	8	9	10
	£	£	£	£	£	£	£	£	£
A Normal expenditure	12,000	500	..	..	5,000	800	..	12,800	
B. Mineral exploitation	..	..	3,500	..	35,000	..	4,000	4,000	
C. Additions to headquarters	..	..	..	6,000	6,000	..	..	..	
D. Caravans	..	..	..	4,000	4,000	..	..	..	
E. Housing	..	..	..	5,000	5,000	..	..	..	
TOTALS	12,000	500	3,500	15,000	55,000	800	4,000	16,800	

3. Hydrology

46. Considering that water is a major factor limiting human endeavour in most parts of Africa, it is surprising how little study has been devoted to the hydrology of rivers or lakes. This is not the fault of technical officers, several of whom have pressed for such work for years past and have carried out intermittent measurements of river flow as opportunity has offered. The possibilities of hydro-electric power in Uganda, which are under examination at present, emphasise the serious lack of data, because records should be available for at least 30 years to be certain of covering the whole range of flow of a river. Clearly the country cannot wait so long before using one of its main assets, but the principle is important in emphasising that the inauguration of regular measurements of river flow must take high priority in any development plan.

47. Uganda is more fortunate than other East African territories because initiative from Egypt has provided records of the discharges at certain points on the main tributaries of the Nile for the past seven years. There are three such points on the Kagera river, three on the Semliki, three on the Victoria Nile, including one above and one below Lake Kyoga, and two on the Albert Nile. At each of these the discharge is measured once per month in order to establish discharge curves for different levels, and the level is measured daily. These few records are, however, extremely inadequate. Not only is it desirable to establish permanent recording stations on major streams, including those arising on Mount Ruwenzori and Mount Elgon, but the discharges of water from a number of swamps, selected as representative of the different kinds, should be measured in order to provide background for operations which must ultimately control the water regime of swamps (see para. 130).

48. The examination of the possibilities of Nile control and hydro-electric development n Uganda (see para. 267) should be an opportunity for examining the situation thoroughly prior o establishing a hydrological service. How the service should be organised and to whom it should e responsible can remain undecided for the time being. Like the development of water supplies n rural areas, hydrology might appropriately come under the wing of the Geological Department o long as geology remains organised on a territorial basis. An interterritorial hydrological service would have obvious advantages because the problems exist in Kenya and Tanganyika in equal neasure. Moreover, Egypt and the Sudan would be interested in an increase of recording stations n the upper tributaries of the Nile and therefore might be willing to contribute to the cost. If rganised interterritorially, a hydrological service might qualify for finance in part from the regional olonial Development and Welfare vote.

49. Pending decision on this question, provisional entries are made in Table 1 of £4,000 in olumn 4, rising to £5,000 in column 8, and of £20,000 in column 5 for an office, two European houses, pparatus and other non-recurrent expenditure. In the Indian Irrigation Service, where hydrology well developed, a unit consisting of a small team of experts and their assistants is estimated to st about £2,500 per annum. In East Africa the cost is likely to be considerably larger, but the ove allocations, together with a contribution from Colonial Development and Welfare research nds for which application has been made, and perhaps a contribution from Egypt, should ffice to provide for two such units by the end of ten years. Perhaps one unit should be ncerned mainly with investigation and the other should assist in engineering projects designed control the flow of water.

50. It is convenient to consider the subject of water pollution in this section. This has not t become important in Uganda because the extent of lakes and the flow of rivers is so great and e amount of water-borne polluting materials is so small. If industries develop in the neighbourhood Jinja, however, or if flax retting or sisal processing is undertaken near small streams, or again, water-borne sewerage systems are installed in all the larger towns, the problem will arise as it has ne in nearly every other country. The pollution of streams has already caused difficulties in other rts of East Africa, where advice and assistance has been obtained from the Water Pollution esearch Board of the Department of Scientific and Industrial Research. Water pollution is much ier to prevent than to cure, so all plans for industries should be closely scrutinised from this nt of view.

FIGURE 3.—WATER SUPPLIES IN RURAL AREAS

The Green overprint is the position as recorded in 1936. The Red overprint shows watering points installed mainly by the Water Supply Section of the Geological Survey

4. Water Supplies in Rural Areas.

51. Water supplies are often classed among social services, but for the purposes of this plan I regard those in rural areas as an essential part of productive services because a main result of providing them is to bring new country into production. Water supplies in towns are mentioned later under Urban Development.

52. In spite of many lakes and rivers and an abundant rainfall Uganda still has an acute water problem. Figure 3 represents the position in 1936, but it has not materially changed since then because the provision of new supplies during the past ten years has been accompanied by a large increase in the demand for water by the rural population. It shows that only in a few areas, chiefly those of heavy rainfall and near lakes and swamps, are supplies sufficient. In a large part of the country, including some of the most densely inhabited districts, conditions remain difficult or bad.

53. The bulk of the population relies on local water holes. These may be supplied by springs or seepage water, or may be merely hollows which collect rain, or pools in river beds. The number of such watering points becomes progressively smaller during each dry season, and this implies that the surviving water holes are more and more frequented, with an increasing risk of their becoming dry and foul. Greater numbers of people and stock have to walk longer distances for diminishing and dirtier water supplies. Those who dwell near permanent holes are particularly liable to water-borne disease.

54. There is no need to elaborate the importance of water supplies as a public service of first importance. They save labour, improve health, open up new areas for development, stabilise settlements, and spread the animal industry so that overgrazing and similar land troubles are reduced. The work of the Geological Department in drilling boreholes and constructing dams to impound flood water has already proved to be of great benefit. Much experience has been gained in recent years and as a result there is now much less waste of effort than formerly; for example, the percentage of successful boreholes has increased from 45% to 85% since drilling operations started about 1930.

55. In 1940 a review of the water-boring programme was undertaken (C. B. Bisset, 1941, *Water-boring in Uganda* 1920/1940) and the needs of the country were assessed in relation to the resources available. The finding was that with the staff and equipment then existing, it would take twenty years to bring water supplies to the standard required throughout the country. Therefore it was planned to double the effort in order to reduce the period to ten years, and this is the policy adopted in this report.

56. Whereas boreholes generally provide the most lasting and disease-proof water supplies, there are some areas, particularly where there are large numbers of stock to be watered, in which reservoirs are more suitable, catching the temporary flow in water-courses or merely concentrating rainfall in tanks. The general position and prospects of reservoirs has been reviewed recently (Bisset, 1945, *Small Reservoirs in Uganda*).

57. The first object of the programme must be to make the water available, with due regard to health, even if the quality is poor. At the same time it is desirable to look ahead to the time when a demand will be expressed for improvements. The establishment of a new borehole is usually followed by permanent settlement around that point, so that a single borehole may be insufficient after a few years. Therefore it is desirable in certain instances to concentrate the bores into batteries rather than to disperse them widely as single units. This can be done more cheaply at the beginning when machinery is in the locality. The borehole provided with hand-pump is generally adequate for domestic water, but involves much hand labour if there are animals as well as men to be watered. Therefore in a few years' time there is likely to be a demand for power to lift the water into small tanks at ground level, from which it may flow into drinking troughs. This,

of course, is the first stage towards piped supplies to villages. In some cases wind-pumps have proved suitable for this purpose. When hydro-electric power becomes available, say within 100 miles radius of Jinja, small electric pumps will no doubt be used at the bottom of boreholes as they are already widely used in India, North Africa and elsewhere. Where neither wind nor electric power is available, it might be possible to institute a service for power-pumping on a regular routine in order to maintain water in reservoirs at ground level. This could be done, perhaps, by using the power from a motor car driving the pump by belt from the rear wheels, on the system frequently used for small portable saw benches. Although this may be looking some time into the future, work undertaken now may be influenced thereby; for example, it may be desirable to sink certain boreholes to a greater depth than usual in order to ensure an adequate delivery of water when power is applied; or again, hand-pumps operated by rotary movement instead of the usual up and down movement could be readily adapted to power drive by belt.

58. In the case of reservoirs the construction of dams to flood swampy valleys produces bodies of water which are suitable for fish production during the first few years, but which become choked with water-lilies and other weeds very soon, and may then harbour snails, mosquitoes and other vectors of disease. In the interests of health, fish production and agriculture, it is desirable that every reservoir should be drained periodically, perhaps every two or three years. When empty, vegetable crops could be grown on its fertile floor. Therefore it may be advantageous to construct reservoirs in pairs in the same drainage channel and use them alternately. When one of the pair was full of water it would produce fish, while the other would produce vegetables. After two or three years the empty reservoir would be filled and the other drained so that a routine of alternating fish and vegetables would be possible without interfering with the permanent supply of water.

59. In areas of highly porous soil but good rainfall there are good opportunities for collecting rain to overcome present water difficulties. Such an area is in the southern part of Kigezi District on the volcanic foot-hills of the Mufumbiro mountains. Ultimately, when housing becomes better and more permanent, water supplies in this area are likely to be developed by catching rain from house roofs. Meanwhile, experiments have shown that a relatively tiny catchment area, built up from the ground in order to be proof from water-borne disease, is sufficient to maintain permanent water in a tank. In all small tanks and reservoirs, the advantage of permanent roofing to exclude light is so great in improving the quality of the water and preventing evaporation that the additional expense is probably worth while.

60. A grant of about £300,000 for the improvement of rural water supplies in Uganda has already been made from the Colonial Development and Welfare vote. This was for a 5-year programme so that the allocation has been increased in this plan.

61. This paragraph explains the entries in Table 3.

A. *Maintenance of existing supplies.*—£5,000 in column 2 is the present expenditure on maintaining boreholes and is largely returned in the form of revenue by reimbursements from Native Administrations. There is no entry in column 3 for normal expansion because all new water supplies are provided for in columns 4 and 5 under new development schemes.

B. *Head Office control.*—£5,000 in column 4, rising to £5,700 in column 8, is mainly on personal emoluments for new staff required to control the increased service. They include a senior geologist, two geologists, an irrigation engineer and office staff.

C. *Departmental drilling section.*—£6,000 in column 4, rising to £6,500 in column 8, likewise provides mainly for new pensionable staff, including a drilling engineer and four European drillers. £60,000 in column 5 provides for new equipment and other charges of a non-recurrent character.

D. *Contract drilling.*—It is intended to continue the present policy of employing contractors for a large part of the drilling programme. It is assumed that expenditure will be at the rate of about £15,000 a year for ten years and can then come to an abrupt close if necessary. Accordingly £150,000 is entered in column 5.

E. *Reservoir Construction.*—£2,000 in columns 4 and 8 provide for the headquarters control of the programme. There is no increase after ten years because this service will be in full operation by the beginning of 1947 and its cost is not expected to rise materially. £160,000 in column 5 is for construction in the field, either by manual labour or by mechanical earth-movers.

F. *Grants for subsidiary supplies.*—£15,000 in column 5 will be devoted to small grants to schools, missions and other institutions which require subsidies in providing or improving their own water supplies.

G. *Maintenance of new boreholes.*—£5,000 in column 4, rising to £7,000 in column 8, provides for the annual maintenance of new boreholes to be constructed during the next ten years at £10 per annum. Most of this amount, like the maintenance of existing boreholes, is expected to be reimbursed by Native Administrations and hence is counterbalanced by an entry of £6,000 in column 10. Reimbursement is less than the full cost of maintenance because one borehole in every six or seven will be drilled for townships or departmental supplies and no revenue is to be expected therefrom.

H. *Housing.*—It is uncertain how many of the additional staff required to carry out the programme will need new houses. An entry of £12,500 is made in column 5 on the assumption that five new European houses will be required.

TABLE 3.—WATER SUPPLIES IN RURAL AREAS

Subject	*1946 Recurrent*	*Normal Expansion 1947–1956*	*Development Schemes 1947–1956*		*Total 1947–1956*	*Forecast for 1957 Annual Recurrent Expenditure*			*1957 Anticipated Revenue from Development Schemes*
		Average annual recurrent additional to 1946	Average annual recurrent during 10 years	Non recurrent in 10 years	Normal expansion plus development schemes [cols. 3 (× 10) + 4 (× 10) + 5]	Residual from normal expansion	Residual from development schemes	Total recurrent [columns 2+7+8]	
1	2	3	4	5	6	7	8	9	10
	£	£	£	£	£	£	£	£	£
A. Maintenance of existing supplies	5,000	..	..	..	..	..	..	5,000	
B. Head office control	..	..	5,000	..	50,000	..	5,700	5,700	
C. Departmental drilling section	..	..	6,000	60,000	120,000	..	6,500	6,500	
D. Contract drilling	..	..	..	150,000	150,000				
E. Reservoir construction	..	..	2,000	160,000	180,000	..	2,000	2,000	
F. Grants for subsidiary supplies	..	..	..	15,000	15,000				
G. Maintenance of new supplies	..	..	5,000	..	50,000	..	7,000	7,000	6,000
H. Housing	..	..	..	12,500	12,500				
TOTALS	5,000	..	18,000	397,500	577,500	..	21,200	26,200	6,000

5. Survey, Land and Mines

62. Surveys are best considered under the three headings of triangulation, topography and cadastral survey. In *triangulation* Uganda is more fortunately placed than many African territories. The main line of geodetic triangulation along the 30th arc of meridian passes through the western part of the country and the Uganda portion is complete except for a small section in the north. The network of triangulation tied on to the 30th arc of meridian series satisfactorily covers the whole of the Protectorate except for the Karamoja District in the east where no triangulation of any importance has been observed. In the completion of this basic work the Survey, Land and Mines Department will co-operate with the central Colonial survey organisation for geodetic and topographic surveys which has now been set up with headquarters at the Colonial Office.

63. *Topography.*—The greater part of the Protectorate has been surveyed in detail, and good topographic maps are available for a very large area. That part of the country lying north of 2°N. and the whole of Karamoja District still require detailed mapping, and arrangements are now being made for the central Colonial organisation to provide the necessary maps by means of air survey. It is expected that operations in East Africa, including Uganda, will start in the autumn of 1947. The air survey will provide not only topographic maps, but photographs, from which a vast amount of information required for development purposes can be gleaned. When the time comes, therefore, it is highly desirable that the air survey be accompanied by examination of the ground by technical officers, particularly geologists, botanists, foresters and agriculturists.

64. It will be some years before the whole of Uganda can be covered by air photographs, and therefore the Director of the department has proposed that the work should be done in three sections which are, in order of priority: first, Karamoja District; second, the remainder of the unmapped area lying north of 2°N.; third, the revision of the area previously mapped and lying south of this latitude. It is desirable to add certain special areas as first priority, notably the area of 500 square miles or so selected for a pilot development scheme (see para. 336), some portions of the shoreline of Lake Victoria, where information is required urgently in connection with hydrological investigations now proceeding (see para. 275), and if possible the new settlement area in western Kigezi in order to assess progress in five or ten years' time.

65. The cost of air survey will be borne by Colonial Development and Welfare funds held by the Colonial Office, but examination of the ground, required to make full use of photographic information, will be the responsibility of the Uganda Government. It is important, therefore, that the technical departments should have specialist officers available for such studies as soon as the photographs become available. As affecting the survey branch of the department there may be need for detailed work, including contouring, in connection with special development schemes.

66. *Cadastral survey* is the present main activity of this branch of the department, and most of the effort is devoted to the survey of the Mailo lands in Buganda in implementation of the Uganda Agreement, 1900. The survey of the land allocated to the Baganda under Section 15 of that Agreement was completed, except for some 154 square miles, in 1936. Dealings in this land are registered on the Torrens System under the Registration of Titles Ordinance 1924 the Registrar of Titles being an officer of the department. The title so issued is guaranteed by Government, and requires a survey for any transaction involving an alteration in area. Due to purchases, inheritance and gifts, it is now estimated that there are some 150,000 surveys required to enable registration to be completed. Owing to shortage of staff the department has been unable to keep pace with the fragmentation of the large estates, and with existing staff there is no possibility of the outstanding work being overtaken within reasonable time. The Provincial Administration attaches much importance to this work, because the social development of the Baganda has come to be bound up with the ownership of land.

67. *Survey training scheme.*—It has been submitted by the Director of the Survey, Land and Mines Department that the most efficient method of overcoming this problem would be to

increase the size of the present Survey Training School, and to increase the European supervising staff. It would take about nine years to make this new survey training scheme fully effective, turning out a regular supply of competent African surveyors. The additional staff would produce an increased revenue from Mailo surveys, and would also enable many other surveys to be carried out in the non-Mailo areas of the Protectorate for which staff is not now available.

68. In planning intensification of survey and registration of Mailo lands in compliance with the undertakings of the Uganda Agreement of 1900, it is desirable to make certain that the heavy work and expenditure involved are in the best interests of the country as a whole and of the Baganda people in particular. Experience in other countries has shown that there are dangers as well as advantages inherent in a system of land tenure based on individual ownership. The dangers are not yet very apparent in Buganda, but they will certainly become so with increased pressure of population on the land. There is first the danger that holdings may be fragmented by sale and inheritance to units which are either too small in size for economic agriculture or so situated that methods of soil conservation are difficult or impossible. For example, long narrow holdings running up and down hills, such as have become characteristic of some Mediterranean countries, would be extremely unsatisfactory in the climate of Uganda. Secondly, there is danger from the owner or would-be owner who has more interest in immediate financial returns from his land than in its development. His activities may be accelerated by the issue of title deeds, which give the small owner something capable of being mortgaged. If the mortgagee has not the interests of the land at heart he may be tempted to force the owner still further into his debt and thereby gradually to obtain possession. Such a process has gone far in some countries to the great detriment of agricultural progress*.

69. In consideration of such dangers, and of the great advantage of the Mailo survey and registration, in that they prevent argument and misunderstanding about ownership and tenancies, I suggest that the legislation concerning Mailo lands should be re-examined to ensure that it is in the true interest of the Baganda people. Over-fragmentation might be avoided in advance by applying limits in area and situation below which no holding may be registered. Land exploitation could perhaps be overcome by instituting agreements between owners and tenants on the well-proved system applying to farm tenancies in Great Britain and other countries which have progressed on a system of individual tenure. The Busulu and Nvujo Law of 1927 already enjoins the tenant to "take good care of the land" and allows for tenant and landlord to claim for compensation for improvements or damage, but this hardly goes far enough. At a later stage a system of Native Government agricultural committees, on the lines of the County agricultural executive committees which have proved so valuable in Britain during the war, might be envisaged in Buganda, perhaps, like the British committees, with power of eviction for bad husbandry.

70. The survey of Mailo lands cannot at present be undertaken economically because the land itself is not of sufficient value to carry increased charges. Therefore any new method whereby the cost of survey can be reduced should be thoroughly examined : for example, it is possible that air photography on large scales might provide a survey of present holdings sufficiently accurate for requirements during the next ten or twenty years. By that time the systems of land use may be modified and the requirements may be different from those of today.

71. Whatever may be decided in these matters, the country as a whole requires more surveyors. Therefore the survey training scheme should take high priority in development, without prejudice to the work which will be undertaken ten years hence.

72. *Uganda Atlas.*—A project to produce an Atlas of Uganda has been discussed from time to time. It would be an aid in planning and assessing the results of development, and also of high educational value. A good example is the Tanganyika Atlas published by the Survey Department at Dar es Salaam. A Uganda Atlas might include maps of the Protectorate on

* In Uganda this applies only to Africans because it is legally impossible for a non-native to obtain possession of native-owned land unless the Governor consents.

a scale of 1 : 2,000,000, showing subjects like distribution of population, meteorological factors such as rainfall and temperature at different seasons of the year, distribution of vegetation, land utilisation including agricultural and mining activities, geology, game reserves, forest reserves and fisheries, distribution of tsetse flies, in addition to the usual subjects like communications and configuration of land and water. An attempt is made to illustrate some of these subjects in this report in order to aid discussion of development measures, but I advocate that the job should be undertaken thoroughly. Much assistance in the collection of data would, no doubt, be obtained from the statistical office proposed in para. 211. The most important factor is, perhaps, the distribution of population, which was illustrated in 1935 by a map in the Uganda handbook. This needs bringing up to-date, but there is little object in doing so until the results of the general census planned for 1948 are available. A Uganda Atlas need not cost much because proceeds of sales outside as well as inside the Protectorate should meet most of the cost of printing and publication.

73. *The mining section* of the department includes a Senior Inspector of Mines, and the staff was increased in 1945 by an Inspectorate at Kikagati which is at present arranged jointly by Uganda and Tanganyika. A full-time Inspector of Mines may soon be required in this area for Uganda alone. Added to this, the development of the mineral industry expected during the next ten years is likely to require additional staff; for example, to carry out inspections in the Eastern and Northern Provinces. This will depend on the development of known deposits and of others which may be discovered.

74. The most important enterprise immediately in view is the exploitation of the extensive deposits of rock phosphate near Tororo, which is very desirable in the interests of agricultural progress all over East Africa. This may need a Government subsidy; if so, it would be suitable for financing from the regional Colonial Development and Welfare vote. Another, perhaps larger, project is the exploitation of the deposits of copper ore at Kilembe on the eastern slopes of Mount Ruwenzori. This again is under discussion so it is premature to outline proposals. A development of great value to the country as a whole might take place if adequate facilities can be made available for concentrating the copper ore on the spot and for transport. The problem of transport is perhaps the more important and is referred to in para. 220. In the same area, at Mohokya, there are large deposits of high-grade limestone already being worked on a small scale for building lime. The limestone and clay, also available in the neighbourhood, would provide the ingredients for the manufacture of cement, and in view of the plan for heavy construction by Government, not to mention other enterprise in building and engineering works, the possibilities of a cement factory are likewise under discussion. Here again the main problem is one of transport. Any improved communications in this area would help the existing Katwe salt industry, which offers opportunities for improvement and development on a considerable scale.

75. This paragraph explains the entries in Table 4.

A. *Normal expenditure.*—This amounted in 1946 to £42,200, of which about £4,300 was spent on mining inspection as shown in column 2. An increase in recurrent expenditure based on present activities is provided by £1,000 in column 3, rising to £1,500 in column 7.

B. *Survey training scheme.*—When complete, the expansion referred to in para. 67 is expected to cost about £25,700 per annum, entered in column 8. This development will take place more rapidly in the earlier than in the later years of the decennium, and therefore is expected to average £16,000 per annum in column 4. The existing buildings of the Survey School will be adequate except for an additional £1,000 non-recurrent expenditure shown in column 5.

C. *Cost of expanded service.*—The effect of the survey training scheme will be to add appreciable numbers of surveyors to the department. The additional costs of their transport, travelling and equipment, is expected to be about £10,000 per annum at the end of ten years (column 8). Since the additional staff will not be available until towards the end of the period, the average during the next 10 years is entered at £3,500 in column 4. Assuming that the bulk of the expanded service will be devoted to work on Mailo lands or other service for which payment is charged, it is expected that the increased revenue from survey and registration charges will amount to £11,000 at the end of ten years, as shown in column 10.

D. *District survey offices and equipment.*—The expanded service will require five additional offices. The buildings and equipment are provided by £9,000 in column 5.

E. *Mining inspectorate.*—Additional staff which is likely to be required is provided for by £2,000 in column 4, rising to £3,000 in column 8.

F. *Housing.*—Provision is made in column 5 for five European houses.

TABLE 4.—SURVEY, LAND AND MINES

Subject	1946 Recurrent	Normal Expansion 1947–1956	Development Schemes 1947–1956		Total 1947–1956	Forecast for 1957 Annual Recurrent Expenditure			1957 Anticipated Revenue from Development Schemes
		Average annual recurrent additional to 1946	Average annual recurrent during 10 years	Non-recurrent in 10 years	Normal expansion plus development schemes [cols. 3 (× 10) + 4 (× 10) + 5]	Residual from normal expansion	Residual from development schemes	Total recurrent [columns 2 + 7 + 8]	
1	2	3	4	5	6	7	8	9	10
	£	£	£	£	£	£	£	£	£
A. Normal expenditure:									
(i) Survey and land	37,900	1,000	..	..	10,000	1,500	..	43,700	
(ii) Mines	4,300								
B. Survey training scheme			16,000	1,000	161,000		25,700	25,700	
C. Cost of expanded service			3,500		35,000		10,000	10,000	11,000
D. District survey offices and equipment				9,000	9,000				
E. Mining inspectorate			2,000		20,000		3,000	3,000	
F. Housing				12,500	12,500				
TOTALS	42,200	1,000	21,500	22,500	247,500	1,500	38,700	82,400	11,000

6. BIOLOGICAL SURVEY

76. During the next ten years the potential for applied research in biological subjects which bear on agriculture, forestry, fisheries and health, will be greatly increased as a result of expansion of territorial services and the establishment of regional research organisations. This increase in applied work, if it is to be efficient, will need a corresponding expansion in fundamental aspects of biological science, and consequently the present organisation, even that for the identification of plants and animals, will be inadequate.

77. For these reasons I have submitted proposals in London for establishing a Colonial biological survey organised regionally, and designed to start on a small scale but to expand over a period of ten years. As far as East Africa is concerned the plan envisages a regional institute with a group of botanists and zoologists who would maintain close contact with territorial department and with the Government centres of biological research in Great Britain. If the usual arrangements for financing new research projects is adopted, that is, all initial capital expenditure and two-thirds of recurrent expenditure from central research funds, and the balance from the territories which will benefit, the contribution expected from Uganda would be about £1,000 per annum for the next ten years, rising to £1,300 in 1957. Appropriate entries are made in columns 4 and 8 of Table 1 pending decisions on this subject.

78. Two further matters of biological importance may conveniently be mentioned here, botanic gardens and nature reserves. The botanic gardens at Entebbe, which are in the charge of the Agricultural Department give unique opportunity of development for scientific and educational purposes, but this is difficult until the botanical side of the Agricultural Department is strengthened. Nature reserves are bound up with the questions of game conservation (para. 128) and national parks (para. 297) but in addition to these large aspects, there will be need for special reserves. An example is the area near Old Entebbe which is gazetted as a bird sanctuary from January, 1947.

7. Tsetse Control*

79. The formulation of a tsetse control programme for ten years ahead can be little more than a guess. The factors governing the natural increase and decrease of tsetse are very imperfectly understood and future developments must therefore depend on the unpredictable behaviour of the fly. The difficulty of planning is enhanced by the fact that the tsetse department is not yet in existence and little past experience of operating large-scale anti-tsetse measures in Uganda is available.

80. Nearly three-quarters of the land area of Uganda is inhabited by tsetse flies and there is abundant evidence of their spread in recent years from the less extensive areas of their distribution twenty or thirty years ago. The spread is almost certainly still proceeding, whereas there is no evidence of a natural withdrawal of fly anywhere. The approximate distribution of the three main species is shown in Figure 4. *Glossina palpalis*, the usual vector of human sleeping sickness of the Gambian type is restricted mainly to narrow strips of country along the shorelines of lakes and permanent water-courses. *Glossina morsitans* and *Glossina pallidipes*, the main vectors of trypanosomiasis in domestic stock, have a much wider distribution which includes large areas of relatively dry country of sparse population.

81. If we knew the reasons for the spread of fly there would be a better chance of controlling them. The factors influencing their distribution are numerous and not yet fully understood: they include the degree of shade, temperature, humidity and other variables of macro- and micro-climates. Generalisations concerning any biological phenomenon are dangerous, but it is believed that tsetse flies cannot live in areas of closed forest with a complete canopy preventing the penetration of sunlight; nor can they live in country which is cleared of low bush leaving isolated trees without underscrub. It seems likely, therefore, that the activity of man rather than purely natural causes has been responsible for their increase in distribution. In the old days, when there were fewer people clustered into closer settlements, more of the country was under forest and clearings for shifting cultivation were restricted but complete. When the cultivated clearings were vacated the bush grew rapidly and soon formed a new canopy so that there was little chance for the fly to obtain possession. Now that there are more people spread more widely most of the closed forest has gone, but in many areas settlement is not dense enough to keep down the bush, so the predominant vegetation is a half-way stage between closed forest and open grass-land, providing conditions favourable for the fly.

82. If there is truth in this hypothesis, the aim of land utilisation in order to combat fly should be either to encourage forest to form a closed canopy, or to clear it completely except for isolated trees. This indeed is one of the objects of present activities against the fly, and is the principle underlying the system of land use proposed for pilot development schemes (para. 317).

83. The problem of clearing fly from Uganda is so vast that it would be waste of time and effort to attempt it everywhere at once. Operations to date have been mostly of a defensive kind. This renders the work highly expensive because the areas of fly are so great and have such wide peripheries. Certain defensive measures must clearly continue in order, for example, to maintain

* See Postscript, para. 416.

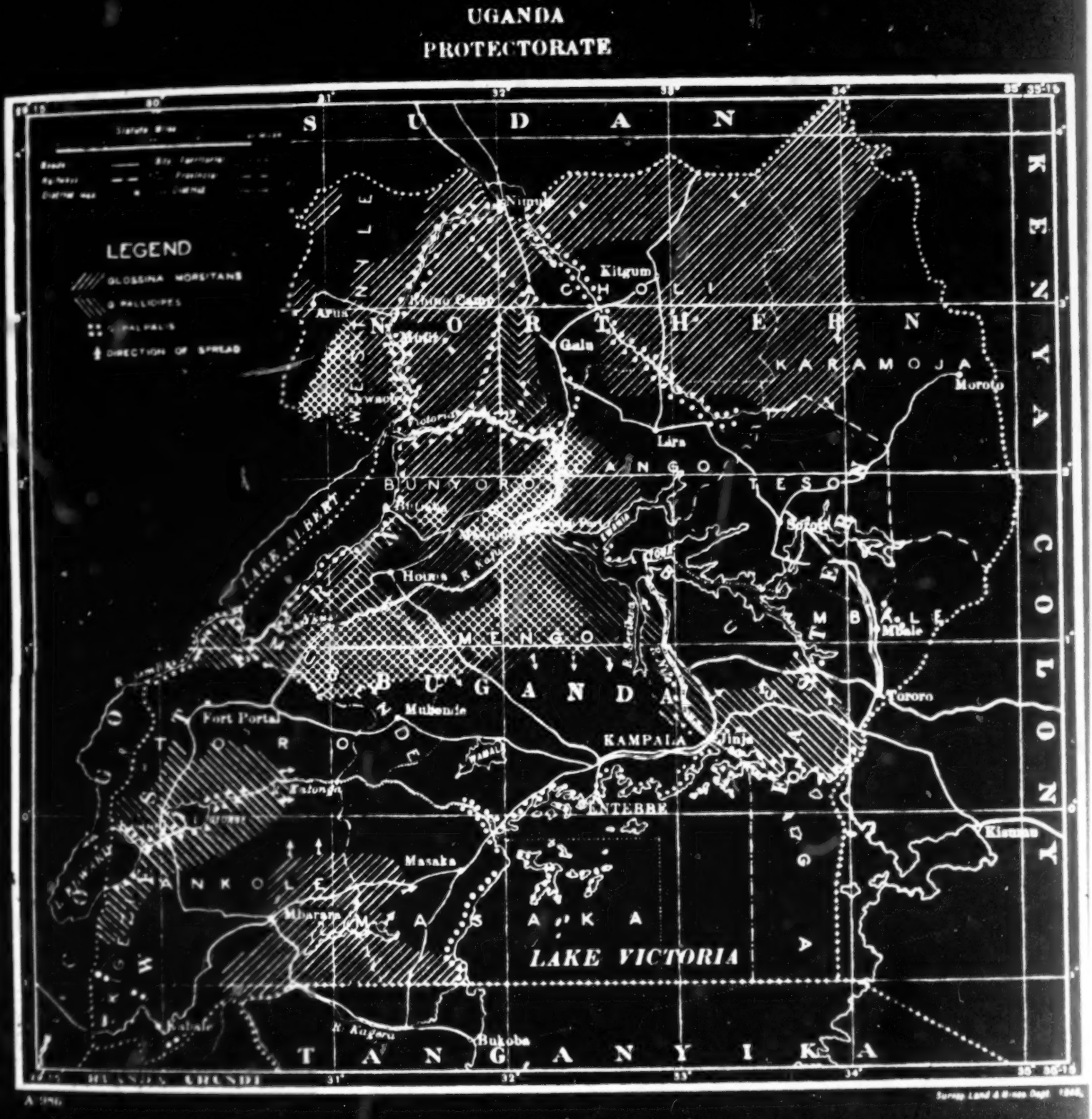

FIGURE 4 — DISTRIBUTION OF TSETSE FLIES

The approximate position in 1946 is shown, based on information supplied by the Medical and Veterinary Departments.

cattle routes, some of which have been rendered impassable; but I suggest that some change of policy is necessary if serious inroads on the fly are to be achieved and permanently maintained. This will be possible only in relatively small areas of intense operations where the fly could be attacked on internal lines of communication and operations could extend outward from focal points. None of this work will be of lasting value unless the land reclaimed is consolidated. Therefore it might be a mistake to reclaim land until it can be used on a system which is much nearer the ideal than that customary in Uganda today. In the long run it may even be found that tsetse flies have been an advantage in that they have caused land to remain untenanted until it can be used in the best interest of the people.

84. Turning to the methods of attack, a great deal of work has been accomplished but with results which are always unpredictable and sometimes disheartening. As an example, one important area, Buruli County of Mengo District on the south side of Lake Kyoga, is being subjected to an annual programme of late burning and eviction of game; some experts say that this area will be cleared of fly within five years, others that it will take ten years or perhaps much longer; both opinions are admitted to be guesses. Such operations tend to be expensive, so that a great deal more investigation of the problem will probably be worth while. Much of this is of a long-term character and therefore best undertaken by the interterritorial tsetse research organisation at Shinyanga in Tanganyika. There is also the insecticide research at Entebbe, organised centrally by the Colonial Office. Other investigations are likely to have local application and must be undertaken in connection with field operations in Uganda. Any of this research may give results of first-rate importance at any time. The more research the greater are the chances of important results.

85. Meanwhile Uganda cannot wait, so a Tsetse Control Department is being established with the principle object of applying known methods of control, mainly late burning, game eviction, and discriminative clearing of bush in selected areas. The department will be sufficiently elastic in its activities to try out on a practical scale any new method which the investigations may indicate to be promising. The centres of attack will be as follows : (1) In Mengo District the main attack will be in Buruli County, the adjoining part of Bulemezi, and the Kyagwe peninsula lying between the Victoria Nile and the Sezibwa swamp, through which used to lie the main cattle route from Teso and Lango to the markets around Kampala; (2) In Ankole District efforts will be devoted to the area near Mbarara, especially the cattle route from the pastoral areas of western Ankole to Masaka; (3) Another point of attack will be east of Lake George near the Katonga River, where the fly is spreading eastward; (4) In Acholi and Lango Districts a large and important area has been selected with headquarters near the District boundary on the road from Lira northward to Kitgum; (5) In South Busoga efforts will be concentrated on the country now vacated on account of sleeping sickness epidemics; this attack is bound up with the scheme for an intensive development of parts of this area (see para. 336); (6) In Kigezi District efforts will be made to drive the fly from the area now being used for resettlement (see para. 349); (7) In Singo County of Buganda which is seriously threatened from the north; (8) Finally, in Karamoja, where the spread of fly is endangering the important cattle industry, points of attack have been arranged in the west and central part of the District.

86. For supervising and co-ordinating this large programme the new Tsetse Control Department will need a headquarters which should be at Kampala to begin with, for ease of consulting the other Government departments concerned, but might be moved later to Masindi when the provincial headquarters now situated there are moved to some more convenient site.

87. The entries for expenditure on the Tsetse Control Department are entered in Table 1 according to the standard scheme applicable to other headings, but the totals are broken down in Table 5 in a form which is modified from the standard because the new department was not in existence before 1947 although expenditure was incurred. This paragraph explains the entries.

A. *Contributions.*—Under the new interterritorial scheme for separating research on tsetse flies from experimental operations on control, it is expected that an annual contribution from Uganda will amount to £10,000 from about 1948. This is provided in columns 2 and 4.

B. *Establishment of Department*:

(i) *Investigational team.*—Uganda must have its own unit for local investigation, consisting of 2 European technical officers, together with twelve selected African assistants. For this unit entries are made of £2,000 in column 2, rising to £3,000 in column 4. For the first year or two, until these technical officers are recruited, the department will rely on advice from medical and agricultural experts.

(ii) *European staff.*—£9,000 in column 2, rising to £12,000 in column 4, provides at the end of ten years for a director, a deputy director, a number of field officers and office staff. Recruitment will be continuous during the period, but mostly during the earlier part.

(iii) *Subordinate staff.*—£6,000 in column 2, rising to £8,000 in column 4, provides for permanent employees of the department, including a number of foremen who will be in charge of gangs of labourers in field operations.

(iv) *Other charges.*—£25,000 in columns 2 and 4 is mainly for field operations in clearing bush, game eviction, controlled burning, etc. An annual recurrent amount will be necessary in order to maintain areas for which the original expense of field operations is included under C. The provision in 1957 is not increased because it is expected that by then the Native Administrations, which will benefit from the opening of new country, will either be controlling fly by their own efforts or will be making contributions for the work to be done by the department. The amount also provides for travelling, stores, and other minor recurrent charges.

C. *Field operations.*—£210,000 in column 3 is intended to cover the non-recurrent expenditure, including the initial field operations in new areas. Experience to date indicates that it is cheaper to clear bush by manual labour than by heavy machinery. Consequently the bulk of this allocation is likely to be spent on temporary employment of labour. This position may change in the course of ten years, in which case part of the funds would be devoted to purchasing mechanical implements.

D. *Offices and equipment.*—£12,000 should be adequate for building a central office and stores, but since the permanent headquarters of the department may remain undecided for some years, an additional £3,000 is included for temporary offices at Kampala. If the headquarters of the department subsequently move to Masindi the capital cost of a new office may be saved.

E. *Housing.*—£25,000 in column 3 provides for six European houses at departmental headquarter and four at district headquarters. Temporary houses in the bush, where most of the field officers will live are assumed to be provided from the provision in column 3 under C.

TABLE 5.—TSETSE CONTROL DEPARTMENT

Subject	*Expenditure* 1947–1956		*Forecast for 1957*
	Average annual recurrent	Non-recurrent in 10 years	Annual recurrent
1	2	3	4
	£	£	£
A. Contributions	9,000		10,000
B. Establishment of department:			
(i) Investigational team	2,000	..	3,000
(ii) European staff	9,000	..	12,000
(iii) Subordinate staff	6,000	..	8,000
(iv) Other charges	25,000	..	25,000
C. Field operations	..	210,000	
D. Offices and equipment	..	15,000	
E. Housing	..	25,000	
TOTALS	51,000*	250,000	58,000†

* Made up from Table 1 column 2 £38,000
column 4 £13,000
£51,000

† Made up from Table 1 column 2 £38,000
column 8 £20,000
£58,000

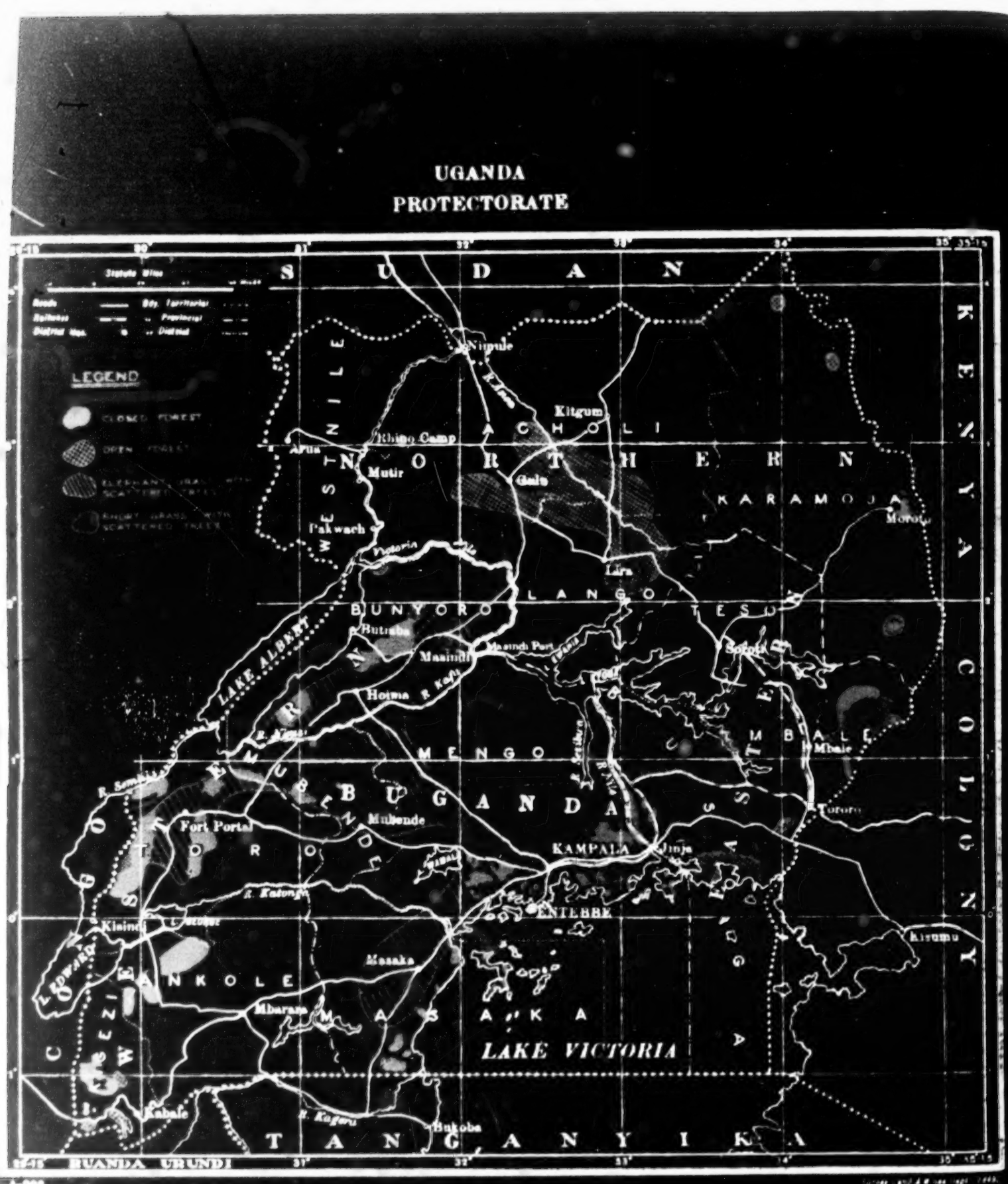

FIGURE 5.—DISTRIBUTION OF VEGETATION

An attempt has been made to indicate the prevalent vegetation in simple categories, based on information supplied by the Agricultural and Forestry Departments. Thus the forest reserves are not shown unless they consist of definite forest. Many reserves, especially in the north and east, are omitted because their vegetation is similar to that of the surrounding country, while considerable areas are shown as open forest although only small parts of them are actual reserves. Probably the best indication of land potential is shown by the distinction into elephant grass and short grass. The elephant grass country is richer and tends to develop into closed forest if not cultivated. Most of the short grass country would develop into open forest. The area shown as short grass includes several distinct associations and so is by no means uniform.

8. Agriculture

88. The agricultural policy of Uganda is to protect, improve and develop the natural resources, aiming at the most economic use of the land and labour available. In achieving these objects it is necessary to provide an adequate and nutritious food supply for the people and at the same time to encourage the maximum production of economic crops for export or of raw materials for local industry. A number of factors which limit progress towards these objectives are considered below before detailing the expenditure which is required

89. There is a lack of knowledge about the agricultural potential of different parts of the country, and their carrying capacity of both human beings and stock. The distribution of vegetation gives some indication, but I am informed by the technical experts that information is as yet quite inadequate to draw an accurate map, even dividing vegetation into the simplest of categories. An attempt to do so has been made in Figure 5 : the main areas of elephant-grass country and of closed forest are roughly correct, but indications on the rest of the map are extremely rough. Fairly extensive knowledge concerning the details of suitable agricultural practices has been acquired, however, from research work undertaken at the two principal experimental stations, namely. Kawanda, in the long-grass country near Kampala, and Serere, in the short-grass country near Soroti. Before detailed plans for agricultural development can be prepared, an extensive agricultural survey is needed, enlarging the information already available in the Report on Agricultural Surveys by Dr. Tothill and members of the Agricultural Department published in 1938. Such a study is impossible until the European staff of the department, at present under strength by twelve European technical officers, is not only made up to full establishment, but added to by additional European officers and as many African assistant agricultural officers as training facilities can produce. The knowledge which is lacking could be obtained only by detailed examination of the country combined with a census to find out where shortage of land and other factors is impeding progress. Perhaps the general census arranged for 1948 will give the opportunity.

90. The transport arrangements for moving food crops within the country to where they are needed, and export crops to the railway system, are at present extremely inadequate. This aspect of agricultural production is considered under the heading of transport (para. 218).

91. Coupled with the need for improved transport is that for storage; firstly to provide a food reserve, sufficient for at least three months for the whole country, stored at convenient places from which it can be carried easily to wherever required, and secondly for export crops. There is also need for storage of seed because there are no organised seed merchants in Uganda, and the people eat up their seed reserves when food is short. The Kenya and Uganda Railways and Harbours system, on which the country is entirely dependent for exports, is unable to carry all produce at peak periods, and this difficulty will become greater rather than less as produce increases, because it will never be economic for the Kenya and Uganda Railways and Harbours to have rolling stock, barges and tugs lying idle for a large part of the year. Therefore storage must be provided in Uganda for export crops, preferably at railway stations or lake ports. It is an open question whether this is best arranged as part of the Kenya and Uganda Railways and Harbours system, as a Government service, or by private enterprise. Great emphasis must be laid on this limiting factor of storage because it has been estimated that under present arrangements as much as one-quarter of the food crops produced in Uganda and a nearly equal proportion of the export crops are lost through the ravages of pests.

92. There are several major factors which limit the use of land for productive purposes. The most important are water supplies, considered in para. 51, tsetse fly in para. 79, and, perhaps above all, man-power, though this last will cure itself in time.

93. Not only are there at present too few people in many parts of the country, but the amount of agricultural work which is accomplished by each man or woman farmer in Uganda is relatively small. This is the result partly of a disinclination for hard work and partly of the lack of adequate

agricultural implements. There is need for more assistance from animals in some areas and mechanical implements in others. This raises the question of mechanically-propelled agricultural machinery, about which very little is yet known in the conditions of Uganda.

94. The average cultivator does not get adequate yields from his crops. For example, the correct spacing for different crops is known, but is not always applied; methods of mulching and the use of manures are similarly known but are rarely applied. An extreme example of neglectful methods is in the picking of cotton: it is estimated that up to one-quarter of the crop in many areas is left unpicked on the plants. If proved and simple agricultural methods were adopted universally it is certain that yields of all crops would increase by more than 25%. Moreover, in the future it is likely that artificial manuring will be possible. Preliminary experiments have shown that application of rock phosphate quarried near Tororo, or of silico-phosphate derived therefrom, with a small addition of nitrogen fertiliser, will increase grain crops by more than 50%. When experimental trials are complete there is little doubt that artificial manuring with cheap materials will be economic over wide areas, but the problem of persuading the African farmer to use such methods will remain. These examples emphasise the great need for education and propaganda in agricultural production.

95. Urbanisation is taking place in parts of Uganda at an accelerating rate, and therefore a market garden industry is needed near towns, particularly within a radius of about twenty miles of Kampala and ten miles of Jinja, in order to provide the vegetables which are required for these urban populations. This will alter the traditional system of growing food for the subsistence of individual families. A large part of the land will have to be maintained under permanent cultivation by methods which include terracing and the use of fertilisers. Much interest has already been shown by farmers near Kampala on account of the high prices of food crops, and a system of fertilising with compost from the factory producing this material from town waste is growing in popularity. The Kampala compost factory has an output now of 2,000 tons per annum, which might well be increased to, say, 10,000 as urbanisation continues. The indications at present suggest that there will be a demand for at least this amount. A market gardening industry is likely to develop naturally on account of the high returns, but assistance will be required in ascertaining the most suitable methods of cultivation and preparation of the land.

96. When the crops are grown and gathered their efficient use depends on adequate storage, already mentioned, and on organisations for marketing and in some cases for processing. The small areas in Uganda which are alienated to European and Indian producers are self-contained in these respects, but the main problem of marketing and processing African peasant crops is yet largely unsolved. In some cases commercial interests have been invoked successfully as Government agents in marketing, a good example being the Bugishu Coffee Scheme; in other cases a solution may be found through co-operative societies, for which guidance and registration by a Government service is outlined in paras. 135 to 137. There is growing need for grading produce and for supervising markets, particularly in order to maintain and improve the quality of exports. This may become a function of the co-operative section, but no special provision is made for staff, because it is assumed that the enlarged Agricultural Department will be able to deal with it. Until there is some system for produce inspection the farmer cannot be expected to appreciate fully that good quality usually means good prices which in turn provide the necessary money to pursue good husbandry, including the use of fertilisers which cause higher returns from the land.

97. The productive capacity of a country at the stage of development represented by Uganda is likely to increase within certain limits in direct ratio to the number of trained technical officers who are employed to supervise the agricultural processes. Therefore it is of the utmost importance to enlarge the Agricultural Department as soon as possible by the addition of European officers and their trained African assistants. With their aid it should be possible to introduce several new schemes which are mentioned elsewhere; for example, the cultivation of rice on a large scale

in the region surrounding Lake Kyoga, which is dependent on the control of the water level of that lake (para. 272) and the production by African farmers organised in economic units, which is a principal aim of the pilot schemes for development outlined in para. 308.

98. A provisional scheme of expenditure is shown in Table 6 prepared with the above limiting factors and projects in mind. This paragraph explains the entries :

A. *Contributions* in 1946 amounted to £8,700 (column 2). They are likely to be increased largely during the next ten years as a result of the projected establishment of an East African agricultural research organisation, and of the central research headquarters of the Cotton Growing Corporation. According to the plan for replacing Amani by an East African agricultural research organisation, the annual contribution, now about £5,000, will have to be increased to about £10,000 in 1948 or 1949, and then will increase gradually to about £12,000 as the organisation reaches full establishment. The Cotton Growing Corporation's projected research centre in Uganda is likely to grow rather slower, but it is expected that a contribution will be required from Uganda amounting to at least £10,000 per annum after ten years, and that the average contribution during the growth period will be about one-half of this amount. Entries in columns 4 and 8 provide for the above.

B. *Normal expenditure.*—The present expenditure of the department, excluding contributions but including some part of the agricultural training of ex-service men, amounts to £104,600 in column 2. On the existing establishment this may be expected to increase by £5,000 per annum in column 3, reaching £7,000 in column 7.

C. *New technical staff.*—For reasons given above the most important development project is to increase the departmental staff of agricultural and specialist technical officers. Accordingly £20,000 is entered in column 4, rising to £25,000 in column 8.

D. *Storage.*—(i) To meet the needs of food storage in Uganda it has been estimated that £60,000 should be expended on permanent stores as soon as possible, and this is shown in column 5.

(ii) In order to provide storage for export crops awaiting shipment or rail at ports and stations, a token figure of £100,000 is shown in column 5. If this storage is provided by the K.U.R. and H. or by private enterprise (see para. 91 above) this amount of capital will not be required from Government but the saving in capital expenditure may be more than compensated for by storage charges.

E. *Mechanical Implements.*—Until trials have been carried out on a variety of implements which have already been ordered, it is impossible to say what expenditure will be required. Accordingly a token figure of £100,000 is included in column 5, though this amount may bear small relation to the actual requirements during ten years.

F. *Market gardening near towns.*— £20,000 shown in column 5 is a token figure to assist in the early stages.

G. *Cotton seed bulking stations.*—The large programme of research on cotton which is envisaged by the Cotton Growing Corporation will be of little value to Uganda unless there is an organisation for the bulk production of improved seed and for ensuring that this seed is used by the peasant cultivators. These activities will presumably be undertaken by the Agricultural Department rather than by the Corporation, and accordingly provision is made of £5,000 in column 4, rising to £12,000 in column 8, and for £75,000 non-recurrent expenditure in column 5.

H. *Chair of Agriculture at Makerere.*—The course for African agriculturists at Makerere has reached an unsatisfactory condition in which in 1946 there is only one student. If higher education of agriculturists is to be developed, it is essential that a proper department be established in this subject, and the first stage must be the appointment of a fully qualified agriculturist as permanent head of a department. Accordingly provision is made in column 5 for £50,000 as an endowment for a Chair of Agriculture. This is not likely to be a sufficient amount in itself, but should be an inducement to the Makerere authorities to develop an Agricultural Faculty into something worth while.

I. *Housing.*—It is expected that in carrying out this programme about twenty new houses will be required for European officers. Accordingly £50,000 is entered in column 5.

TABLE 6.—AGRICULTURE

Subject	1946 Recurrent	Normal Expansion 1947–1956 Average annual recurrent additional to 1946	Development Schemes 1947–1956 Average annual recurrent during 10 years	Development Schemes 1947–1956 Non-recurrent in 10 years	Total 1947–1956 Normal expansion plus development schemes [cols. 3 (× 10) + 4 (× 10) + 5]	Forecast for 1957 Annual Recurrent Expenditure Residual from normal expansion	Forecast for 1957 Annual Recurrent Expenditure Residual from development schemes	Forecast for 1957 Annual Recurrent Expenditure Total recurrent [columns 2 + 7 + 8]	1957 Anticipated Revenue from Development Schemes
1	2	3	4	5	6	7	8	9	10
	£	£	£	£	£	£	£	£	£
A. Contributions ..	8,700		10,000		100,000		17,000	25,700	
B. Normal expenditure	104,600	5,000			50,000	7,000		111,600	
C. New technical staff	..	..	20,000	..	200,000		25,000	25,000	
D. Storage :									
(i) Food reserves ..	..	..	..	60,000	60,000				
(ii) Export crops ..	..	..	..	100,000	100,000				
E. Mechanical implements	..	..	..	100,000	100,000				
F. Market gardening near towns ..	..	..	..	20,000	20,000				
G. Cotton seed, bulking stations	..	..	5,000	75,000	125,000	..	12,000	12,000	12,000
H. Chair at Makerere ..	..	..	..	50,000	50,000				
I. Housing	..	..	..	50,000	50,000				
TOTALS ..	113,300	5,000	35,000	455,000	855,000	7,000	54,000	174,300	12,000

9. ANIMAL INDUSTRY

99. Until recently, rinderpest was considered to be the greatest enemy of livestock in Uganda but with the introduction of goat virus as a means of immunisation the control of this disease has been simplified and it no longer sweeps over the country taking its toll in thousands every year. Its place as a bar to progress has been taken by trypanosomiasis due to the widespread movement of trade stock and the steady spread of the two species of tsetse fly *Glossina morsitans* and *G. pallidipes*. The annually increasing menace of tsetse and trypanosomiasis to the cattle population in Uganda, together with its effects upon economic and sociological problems, cannot be stressed too strongly. It is estimated that at least one-half of the total area of the Protectorate is now uninhabitable to cattle, and the whole livestock industry is threatened by tsetse encroachment upon the remaining cattle-producing areas, which are shown in Figure 6. A difficulty in this connection is that trypanosomiasis often occurs among herds of cattle considerable distances from the original source of infection in fly areas because the disease can be transmitted from one animal to another by biting-flies other than tsetse.

100. While tsetse flies have advanced and seriously upset animal industry in many parts of the Protectorate the cattle population as a whole has slightly increased. In 1930 the total number of cattle in Uganda was estimated at about 2,000,000; in 1945 the figure was 2,300,000. In certain districts, particularly those where human population is dense and therefore the fly has been unable to invade, the cattle have increased markedly during the past fifteen years; for example, in Teso, from 292,000 to 407,000. In other areas the cattle have suffered very drastic reduction; in Buruli they have been almost exterminated, from 13,500 to 150 during five years 1940-1945, as fly has spread

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FIGURE 6 CATTLE INDUSTRY

The information was supplied by the Veterinary Department

through this part of Buganda. In Bunyoro District also cattle have been nearly exterminated. Toro and Ankole Districts have suffered a steady reduction, though not so abrupt. Several of the normal routes of cattle to market have been rendered impassable, so that the economics of the industry have been upset : thus the cattle from Teso and Lango used to cross Lake Kyoga and travel on the hoof down to Kampala, but now they have to be carried there by steamer and railway.

101. The problem is to be tackled mainly by measures against tsetse flies (see para. 85). In addition the Veterinary Department intends to treat trypanosomiasis with the new drug, Phenanthridinium, on a very much larger scale than has yet been possible.

102. Although satisfactory control of the major epizootic diseases, and of most endemic diseases with the exception of trypanosomiasis and East Coast Fever, has been effected, the dangers of fresh outbreaks are always present. Therefore the present system of field veterinary services and laboratory work on diagnosis and investigation must continue, but the present effort in these directions is probably adequate until the animal population has greatly increased. It is assumed that research on diseases will be pursued actively meanwhile by the projected Central Veterinary Research Institute at Kabete, near Nairobi.

103. Meanwhile the Veterinary Department has been able to devote efforts to the development of the livestock industry. Organised livestock markets have been established throughout the Protectorate and sale numbers increased rapidly until a peak was reached in 1942 when the consumption figure for cattle was nearly 500,000, and for sheep and goats approximately 1,000,000. These figures give a consumption rate of 20% of the total estimated cattle population and approximately 30% of the total sheep and goat population. These consumption rates were too high if the industry was to expand, so control measures were introduced to conserve the existing supplies of livestock.

104. The hide and skin industry has been greatly improved and a ghee industry has been established so that Uganda now exports this product to Kenya instead of importing. But the most encouraging sign is that the development of the livestock industry over the past fifteen years has resulted in a radical change in the outlook of the African towards his livestock in many parts of the country, and the rearing of animals is now definitely regarded as a commercial undertaking and a source of income. Thus the common conception that a main problem is to persuade the African to part with his livestock no longer applies in Uganda except, perhaps, in the more remote parts of Karamoja where there is still danger of local overstocking. The main problem is the opposite one of rearing larger herds and flocks to replace the over-consumption which has taken place during the war.

105. Therefore much importance attaches to improved methods of livestock management which have been introduced especially in the densely populated areas of Buganda where much progress has also been made in the development of mixed farming. Special "livestock improvement areas" in Kyagwe of Buganda and Kyoga of Lango District, aim at improving the quality and management of cattle, sheep, goats, pigs and fowls, and are proceeding satisfactorily.

106. Recent work on the livestock industry has shown not only that improvements can be effected, but also that the pace of improvement is seriously limited by lack of basic knowledge about the cattle breeds, their feeding requirements, the grazing lands, and the multitude of related subjects which are involved in any animal industry. In this respect there seems to be a difference between the animal and plant industries of Uganda in that research on crops has proceeded over many years so that satisfactory methods of cultivation have been worked out for wide application whereas in animal industry the study of stock has been delayed by the necessity for work on disease. If the country is to look forward to a balanced system of plant and animal industry, the leeway on the animal side must be made up as soon as possible, and the plan of expenditure is based on this principle. The main development schemes come under the heading of livestock improvement

and include the proper establishment of an experimental farm at Entebbe on land which is available and already partly developed for the purpose. A large herd of improved stock will be built up there and used for extension experiments, especially in Buganda. A supplementary stock farm will be established at Mbarara to serve the stock areas of Ankole District. It is also proposed to select additional livestock improvement areas where efforts will be concentrated on improving animal industry.

107. In view of the change of outlook which is now taking place in the work of the Veterinary Department and the new problems which are coming more and more to occupy the greater part of the energies of the department, it would appear appropriate that a title should be found to describe more correctly the scope of future work. I suggest that such a title as "Department of Animal Industry" might be suitable.

108. This paragraph explains the entries in Table 7.

A. *Contributions.*—At present the contribution to interterritorial veterinary rsearch is at the rate of £700 per annum, and there is a contribution of £300 for Veterinary scholarships. When the laboratories at Kabete are fully established it is expected that the contribution from Uganda will have to be increased to about £10,000 per annum. It is assumed that the contribution will rise to the new level after three years and provision is made of £6,000 in column 4, rising to £9,300 in column 8, with this in view.

B. *Normal expenditure.*—For reasons given above, a large expansion of curative work is not required until there is a larger head of stock. Therefore an average annual increase of recurrent charges of £1,000 in column 4, rising to £1,500 in column 7, may be sufficient.

C. *Livestock improvement:*

(i) *Entebbe Experimental Station.*—£3,000 in column 4, rising to £5,000 in column 8, provides for the maintenance of the farm, the purchase of animals, and for additional staff, including a farm manager, a chemist, a pasture research worker and their assistants. £5,000 in column 5 is for animal buildings, fencing and equipment, and water supplies to the paddocks.

(ii) *Mbarara stock farm.*—£1,200 in column 4, rising to £2,000 in column 8, provides for maintenance and for a farm manager and assistants. Other personnel will visit the farm from Entebbe as required. £4,000 in column 5 is for buildings, etc., on a scale smaller than at Entebbe.

(iii) *Livestock improvement areas.*—£2,000 in column 4, rising to £2,500 in column 8, is mainly for the purchase and replacement of stock in about ten selected areas where work will be started during the period. African staff will be posted to these areas from the existing establishment of the department. £8,000 in column 5 provides for clearing and fencing.

(iv) Weighbridges.—£5,000 in column 5 is for the purchase of these machines, which are required in the development of the cattle industry.

D. *Disease control:*

(i) *Trypanosomiasis.*—£700 in column 4, rising to £1,000 in column 8, is for special African staff required for the treatment of this disease. £9,000 in column 5 is for the purchase of drugs, including Phenanthridinium, which gives high promise as a cure, and for supplementary equipment.

(ii) *Dips and sprays.*—£700 in column 4, rising to £1,400 in column 8, is for maintenance and for the purchase of insecticides. £25,000 in column 5 is for the purchase of spraying equipment and for the construction of dips required in the control of ticks, and perhaps also of tsetse flies. Whereas it may be necessary to provide new dips in the immediate future in order to carry on the present system of tick control, expenditure of the bulk of the capital will be postponed until research on new insecticides has progressed further.

E. *Housing.*—£10,000 in column 5 provides houses for three additional Europeans at the Experimental Station, Entebbe, and a farm manager at the stock farm, Mbarara.

TABLE 7.—ANIMAL INDUSTRY

Subject	1946 Recurrent	Normal Expansion 1947–1956 Average annual recurrent additional to 1946	Development Schemes 1947–1956 Average annual recurrent during 10 years	Development Schemes 1947–1956 Non-recurrent in 10 years	Total 1947–1956 Normal expansion plus development schemes [cols. 3 (×10)+4 (×10)+5]	Forecast for 1957 Annual Recurrent Expenditure Residual from normal expansion	Forecast for 1957 Annual Recurrent Expenditure Residual from development schemes	Forecast for 1957 Annual Recurrent Expenditure Total recurrent [columns 2+7+8]	1957 Anticipated Revenue from Development Schemes
1	2	3	4	5	6	7	8	9	10
	£	£	£	£	£	£	£	£	£
A. Contributions	1,000	..	6,000	..	60,000	..	9,300	10,300	
B. Normal expenditure	36,600	1,000	..	..	10,000	1,500	..	38,100	
C. Livestock improvements:									
(i) Entebbe experimental station		..	3,000	5,000	35,000	..	5,000	5,000	1,000
(ii) Mbarara stock farm		..	1,200	4,000	16,000	..	2,000	2,000	1,000
(iii) Livestock improvement areas		..	2,000	8,000	28,000	..	2,500	2,500	
(iv) Weighbridges		..	..	5,000	5,000	..	..	..	
D. Disease control:									
(i) Trypanosomiasis		..	700	9,000	16,000	..	1,000	1,000	
(ii) Dips and sprays		..	700	25,000	32,000	..	1,400	1,400	
E. Housing		..	..	10,000	10,000	..	..	..	
TOTALS	37,600	1,000	13,600	66,000	212,000	1,500	21,200	60,300	2,000

10. FORESTRY

109. During the war the more accessible forests of Uganda had to be exploited to such an extent that serious inroads have been made into the capital of timber. Consequently, for perhaps half a century the accessible forests must be left to regenerate, assisted locally by replanting, the rotation envisaged being well over a century. There are, however, several large forests which have remained untouched on account of their lack of accessibility and doubtful quality and quantity of timber but which may prove capable of development after a period of investigation and when communications are improved. Among them are the "impenetrable forest" in Kigezi, the north-western forests of Ankole, patches of forest between Mount Ruwenzori and Lake Albert, the development of which will be helped by the proposed Ndaiga road (see para. 244), and some parts of South Busoga. With so little timber available from those forests which are already under working plans, it is highly desirable to bring at least parts of these untouched areas into production. This cannot be done, however, without considerable initial expenditure.

110. In addition to an expanding programme of timber production from natural forests, the growing demand for softwood timber, especially for the building needs of Africans, must be met in the future by establishing plantations in the upland regions best suited to them. For example, cypress is being planted in Kigezi at the rate of 80 acres per annum but it is desirable to step up the programme to 100 acres per annum. Similar schemes are required in Ankole, Toro and West Nile or North Acholi, where timber is likewise scarce, at a similar rate of about 100 acres per annum in each District. The rotation visualised is 35 to 40 years.

111. The requirements of fuel and building poles cannot be met from the main forest areas but are best provided by plantations established in various parts of the Protectorate. The tree most suitable for this purpose through most of Uganda is Eucalyptus, which is cut on a rotation of eight years. Experience with Eucalyptus has shown that receipts in the ninth year more than cover the cost incurred during the preceding eight years. The trees are then coppiced and yield a steady revenue at the rate of about 3% per annum on the original capital expenditure. It is intended to develop these fuel and pole plantations at the rate of 440 acres a year for eight years, the plantations being situated near Kampala, Fort Portal, Hoima, Arua and Masindi. Perhaps other plantations could be established in areas near dense population where supplies are not yet adequate.

112. The protective aspect of forests is less important in Uganda than in many countries which do not enjoy such a good climate and rainfall. There are, however, certain areas where protective forests are of prime importance, notably the ridge of high land which separates Karamoja District from Turkana along the north-eastern frontier of Uganda, some parts of the highland region of Kigezi and, perhaps, the watershed between the Congo and Nile drainage forming the north-western frontier of West Nile District. The value of forests in protecting watersheds and slowing down the run-off will become of increasing importance as the land of Uganda is more fully used. Therefore, in making further plans for forest reserves and plantations, the future condition of land when fully populated must be kept constantly in mind. At present, 7·5% of the land area of the country is forest reserve, but the proportion varies greatly according to the Province, being about 12% in the Eastern Province, 7·4% in the Western Province, and only 2·9% in Buganda Province. It is significant that in India, where forest policy has been more highly developed than in Africa, the correct proportion of forests to total land area is reckoned at 25%. For this reason, protected forest along the watersheds is included as an integral part of any plan for a pilot scheme in the development of Uganda (see para. 323).

113. With the above objects and problems in mind, expenditure is proposed as in Table 8. The entries are explained as follows:—

A. *Contributions.*—At present there are contributions of £200 annually, shown in column 2, to the Imperial Forestry Institute at Oxford and the Forest Products Research Laboratory at Princes Risborough. This is assumed to continue, but in addition a substantial contribution is likely to be required for interterritorial East African forestry research. On the assumption that this will be at the rate of £3,000 per annum commencing in 1950, £2,100 is entered in column 4, rising to £3,000 in column 8.

B. *Normal Expenditure.*—The Forest Department has been functioning under strength for many years. Moreover, most of the existing staff are relatively young so that normal increments to emoluments, etc., will be heavier than in most other departments. These matters are provided for by £6,600 in column 3, rising to £10,000 in column 7.

C. *Investigation (Specialist Staff).*—In addition to interterritorial investigation, the Uganda Forest Department requires a botanist-ecologist and a forest engineer. Both are assumed to be appointed in 1948, and with assistant staff and requisite facilities for work, will together cost about £3,000 per annum. The duties of these investigational officers will be concerned especially with preparations for exploiting new forest areas and bringing them under working plans. They are provided for by £2,700 in column 4, rising to £4,000 in column 8.

D. *Equipment.*—The department has at present no heavy equipment. With the policy of developing new forests, the department must itself have some items of equipment, such as a portable sawmill, to be used primarily for the investigations of the forest engineer. £10,000 for this purpose is entered in column 5.

E. *Softwood timber plantations.*—The project for establishing plantations (see para. 110) is provided for by an entry of £21,000 in column 5.

F. *Fuel and pole plantations.*—These are provided for by £25,000 in column 5.

G. *Forestry School.*—An ideal site for a forestry school which is much required for the training of African personnel for the Forest Department and Native Administrations, is available on the edge of the

Budongo Forest in Bunyoro District. At present, the site is occupied by a large camp of Polish refugees. When they depart, the more permanent buildings could be readily modified as a forestry school. This is estimated to cost £3,000, entered in column 5.

H. *Labour lines.*—£10,000 in column 5 is for housing forest employees.

I. *Housing.*—£22,500 in column 5 provides for nine European houses required under B and C above.

114. *Revenue from development measures.*—Revenue from forests has been artificially inflated in recent years by excessive demands during the war. It is expected to drop, from about £57,000 in 1946 to £30,000 in 1947. Assuming that the Forest Department's activities increase in accordance with the above schemes, it is estimated that revenue from the forests and plantations will increase from the 1947 estimated figure of £25,000 to about £36,000 by the end of ten years. Therefore £11,000 is entered in column 10. After that time the increase will be more rapid as new plantations come into production so that, after a further two decades, revenue from the forests is expected to equal the whole departmental expenditure. Thereafter revenue will continue to increase at a greater rate than expenditure, provided that the annual planting programme is not diminished.

TABLE 8.—FORESTRY

Subject	1946 Recurrent	Normal Expansion 1947–1956	Development Schemes 1947–1956		Total 1947–1956	Forecast for 1957 Annual Recurrent Expenditure			1957 Anticipated Revenue from Development Schemes
		Average annual recurrent additional to 1946	Average annual recurrent during 10 years	Non-recurrent in 10 years	Normal expansion plus development schemes [cols. 3 (×10)+4 (×10)+5]	Residual from normal expansion	Residual from develop ment schemes	Total recurrent [columns 2+7+8]	
1	2	3	4	5	6	7	8	9	10
	£	£	£	£	£	£	£	£	£
A. Contributions	200		2,100		21,000		3,000	3,200	
B. Normal expenditure	38,200	6,600			66,000	10,000		48,200	
C. Investigation (Specialist staff)			2,700		27,000		4,000	4,000	
D. Equipment				10,000	10,000				11,000
E. Softwood timber plantations				21,000	21,000				
F. Fuel and pole plantations				25,000	25,000				
G. Forestry school				3,000	3,000				
H. Labour lines				10,000	10,000				
I. Housing				22,500	22,500				
TOTALS	38,400	6,600	4,800	91,500	205,500	10,000	7,000	55,400	11,000

11. Fisheries

115. Uganda contains about 13,600 square miles of water, about 17% of the total land area. All the lakes and rivers support fisheries but the number of people engaged in the industry is unknown. The Game Warden has done much to keep fisheries in the picture of development during past years, but his staff has consisted only of African fish guards. The time has come when the Protectorate can no longer afford to neglect the large potential resources which exist in its lakes and rivers.

116. Estimation of the quantities and value of fish taken annually from Uganda's waters and swamps is difficult. One corner of Lake Edward produces more than 3,000 tons per annum, worth nearly £40,000 wholesale; the north-east corner of Lake Albert is producing fish to the value of nearly £20,000. Lake Victoria certainly produces a good deal more than £50,000 worth, and to these must be added innumerable smaller fisheries in lakes, swamps and rivers which are quite impossible to assess. Applying known principles of natural productivity from water and recognising the extent of fishing waters which remain undeveloped, as shown in Figure 7, the annual crop under full development should be at least several times more than at present. Added to this there is abundant opportunity for an organised fish farming industry in ponds made for purposes of water supply, or specially for rearing fish. Very heavy crops up to 1,000 lbs. per acre per annum should be obtainable under proper management. These figures are mentioned in order to demonstrate that the fisheries of Uganda are worthy of development.

117. Ignorance about the fish and fisheries is still so great that much of the potential development must await results of investigation. Arrangements are now made for the establishment at an early date of interterritorial fishery research for the inland waters of East Africa. A site for the headquarters of a fishery institute has been selected at Jinja; a vote has been made from central Colonial research funds to cover the capital cost and recurrent cost for the first five years, in all, £115,000; a director of the organisation has been appointed; and arrangements are in train for appointing other staff and for erecting the necessary buildings and acquiring equipment and apparatus. Thus the stage is set for an organised study of fisheries and their scientific background.

118. Research in itself is insufficient without means for translating its results into practice. Therefore I propose the establishment of a Fisheries Department which should, for the time being, be responsible to the Game Warden and later might be developed as a separate department. The first essential will be a properly trained fishery officer, comparable to an agricultural officer, for each of the main fishery areas. There should be one in charge of Lake Albert, another operating on Lakes Edward and George, and a third on Lake Kyoga. A fourth officer for Lake Victoria would be a direct employee of the Lake Victoria Fisheries Board, which it has been decided to establish on an interterritorial basis. As in the Department of Agriculture, each officer would have several trained African assistants and there would also be need for a considerable number of fishery guards to ensure that the industry is adequately supervised and controlled. Arrangements for training Colonial fisheries officers in Great Britain are now in being, so there need not be long delay in obtaining European staff.

119. Fortunately there is some recorded information about the lake and river fisheries of Uganda in the form of published reports of short term work by visiting scientists in 1927-1931. Added to this there is much information in the annual reports of the Game Department. A first task of the fisheries officers should be to re-examine the existing fisheries in each of the main areas in the light of this previous information and in consultation with the Fishery Research Institute at Jinja. Each fisheries officer must have an adequate launch from which he can work with reasonable comfort and with which he could, from time to time, try out new fishery methods and perform other work on the advice of the research institute.

120. A new fishing industry which requires attention and perhaps some measure of control, is that for crocodiles, which is rapidly expanding around the shores of Lake Kyoga. This new enterprise deserves encouragement, not only on account of the direct profit from the sale of crocodile skins, but also because the depredations of crocodiles have up to now prevented the

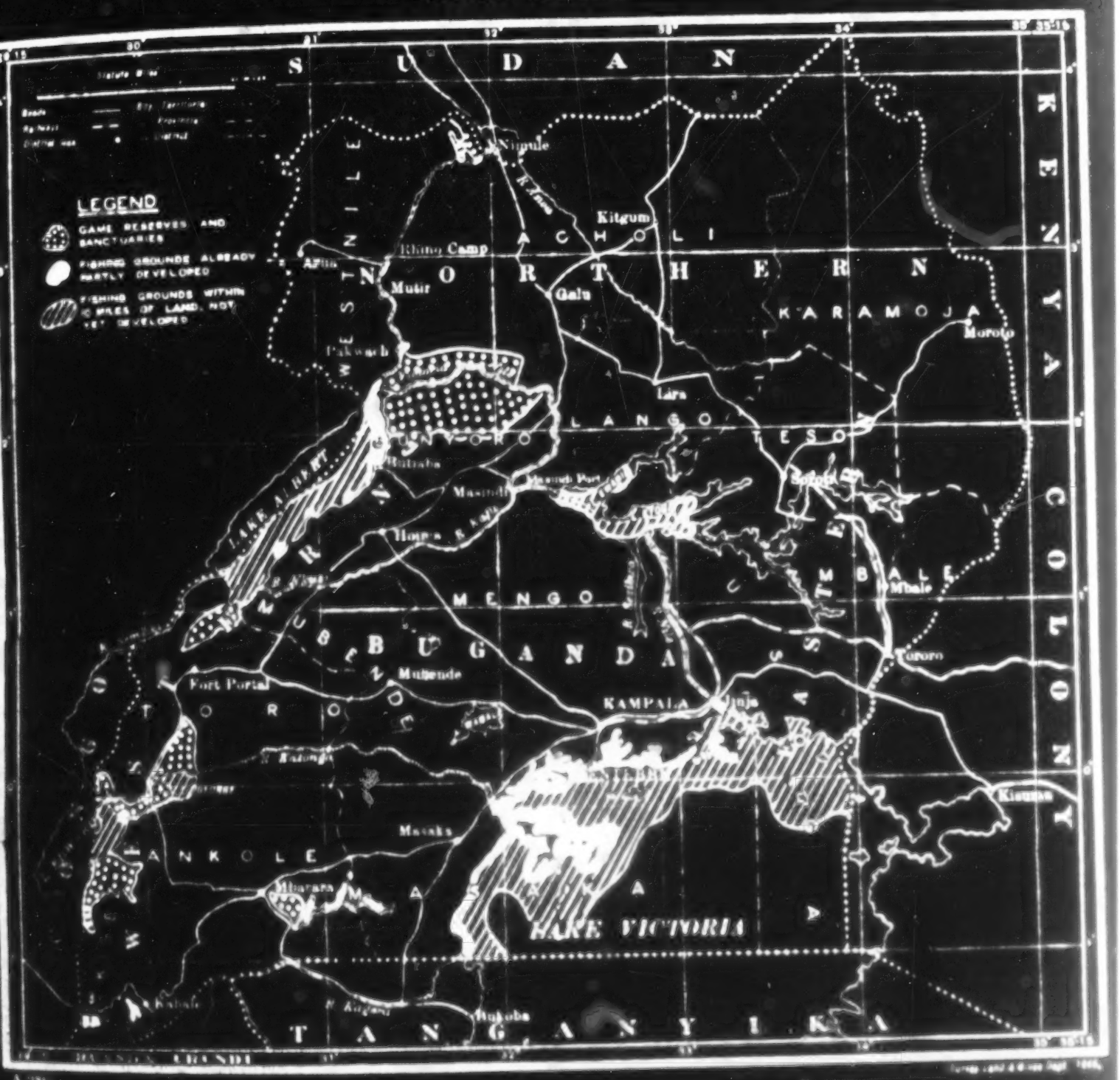

FIGURE 7 — FISHERIES AND GAME RESERVES

development of improved fishing technique. The industry is no doubt capable of extension to other crocodile-infested waters, and awaits early attention from the proposed fishery department.

121. The fishing craft used by the present native industry consist of dug-out and plank-built canoes made from local materials and, within the limitations of African industry, are well suited to local conditions. These craft are, however, seriously limited in range so that the present fisheries are largely restricted to inshore conditions. If the more distant waters are to be developed, the introduction of improved and larger fishing craft provided with power or sail is desirable. Accordingly it may be necessary to establish a new boat-building industry which would no doubt pay for itself once the fisheries are developing satisfactorily. Such an industry will, in its initial stages, probably require a subsidy which will be devoted mainly to training craftsmen. An improved type of fishing craft in the Sese islands is already being introduced at the instigation of His Excellency the Governor.

122. A change in the type of fishing craft will be slow, so that in the early stages of expanding fisheries the principle of the "mother ship" might be adopted with good effect. A motor launch could tow half-a-dozen or more canoes to waters several times as distant as the canoes can reach by themselves, and the launch could carry the catch rapidly to port. Occupants of the launch could also supervise the fishing activities, an important consideration on account of the dangers of sleeping sickness round many of the shores of Uganda's waters.

123. The consumption of flax fishing nets on Uganda lakes is already large, amounting to approximately 80,000 nets per annum. All of these nets are at present manufactured in Great Britain and their price has to include transport and customs duty. There are also some nets which are made by the local fishermen from cotton thread and are difficult to control in regard to size of mesh. The establishment during the war of a flax industry in Kigezi District, and also in Kenya, suggests that the fishing nets required in East Africa might be manufactured locally from locally-grown products. A rough calculation indicates that if the production of flax in Kigezi was increased by about 50%, sufficient would be available to make all the fishing nets at present used in Uganda. Looking forward to a doubling of the fishing effort in a few years' time, there may be opportunity to treble the flax industry and use all the product in East Africa. If a net-making industry is established it will have to be under control by Government to ensure that the nets of various mesh are used only in those waters to which they are suited, because only by this means can the stock of young fish be maintained to ensure a steady growth of the fishing industry to the limits of natural productivity, but not beyond. Already over fishing has had serious effect in certain parts of Lake Victoria and it is highly important to avoid it happening in new areas awaiting development.

124. The marketing of fish and fish products is as important as catching the fish. In this the co-operative movement will no doubt help, and there may be need for an officer of the proposed fishery department concerned specially with marketing organisation. There should also be room for activity by commercial organisations, perhaps employed as Government agents on a profit-sharing basis somewhat on the lines of the marketing arrangements applying to the Bugishu Coffee Scheme. A commercial firm which recognises the general potential of fisheries organised on simple lines often using fishing equipment made by Africans from local materials like papyrus and reeds, could bring great prosperity to the industry by buying and distributing fish in many parts of the Protectorate. Such an arrangement would presumably involve no expense to Government and might well produce revenue. The question of tapping the truly open waters of Lake Victoria by large sea going craft must, in my opinion, await the results of investigation.

125. This paragraph explains the entries in Table 9.

A. *Contributions*.

(i) *Interterritorial research*.—The institute at Jinja is fully provided for from central Colonial Development and Welfare funds for five years. Thereafter it is assumed that an arrangement will be made to provide about two-thirds of recurrent cost from central research funds and one-third from the three participating Governments. The entries in columns 4 and 8 are made with this in view.

(ii) *Lake Victoria Fisheries Board.*—The Board when fully established intends to employ a chief fisheries officer and three assistant fisheries officers, together with subordinate staff. The capital expenditure required for housing, launches, office buildings and equipment is suitable for financing in whole from the regional allocation of the Colonial Development and Welfare Fund. In addition a proportion of the recurrent cost, say one-half, may be provided from the same source. This leaves one-half of the recurrent cost to be provided by the three territories, and the share of Uganda is covered by entries in columns 4 and 8.

B. *Normal expenditure.*—£100 in column 2 is at present on fish guards under the Game Department vote. No provision is made in column 3 for normal expansion because the establishment of a fisheries department is regarded as a special development scheme.

C. *Establishment of Fisheries Department.*—£7,000 in column 4, rising to £10,000 in column 8, provides for three European fisheries officers, an adequate number of African staff, upkeep of launches, and other recurrent charges. £3,000 in column 5 will provide for office accommodation for the three fisheries officers.

D. *Three launches* are provided for by the entry of £15,000 in column 5.

E. *Equipment.*—£5,000 in column 5 is for an initial outfit of fishing gear and other necessities required in the three lake areas of Uganda.

F. *Boat-building industry.*—£10,000 in column 5 is intended to initiate one or more training centres, including short-term contracts for artisans who will function under the direction of fisheries officers.

G. *Housing and offices.*—£7,500 in column 5 is for housing the three fisheries officers.

TABLE 9.—FISHERIES

Subject	1946 Recurrent	Normal Expansion 1947–1956	Development Schemes 1947–1956		Total 1947–1956	Forecast for 1957 Annual Recurrent Expenditure			1957 Anticipated Revenue from Development Schemes
		Average annual recurrent additional to 1946	Average annual recurrent during 10 years	Non-recurrent in 10 years	Normal expansion plus development schemes [cols. 3 (× 10) + 4 (× 10) + 5]	Residual from normal expansion	Residual from development schemes	Total recurrent [columns 2 + 7 + 8]	
1	2	3	4	5	6	7	8	9	10
	£	£	£	£	£	£	£	£	£
A. Contributions:									
(i) Interterritorial research ..	..	..	500	..	5,000		1,000	1,000	
(ii) Lake Victoria Fisheries Board	..	..	1,300	..	13,000		1,500	1,500	
B. Normal expenditure	100	..	..	..	..			100	
C. Establishment of Fisheries sub-department ..	..	..	7,000	3,000	73,000		10,000	10,000	
D. Launches	..	..	..	15,000	15,000				
E. Equipment	..	..	..	5,000	5,000				
F. Boat-building industry	..	..	..	10,000	10,000				
G. Housing	..	..	..	7,500	7,500				
TOTALS ..	100	..	8,800	40,500	128,500		12,500	12,600	

12. Game

126. The Game Department has done good work in saving the unique fauna of Uganda for posterity in certain areas and in controlling wild animals in other areas to defend the people and their agriculture. It has also contributed notably to basic knowledge, especially concerning the mammals and birds of Uganda. Latterly, the department has also taken responsibility for fisheries. Thus it helps both directly and indirectly in the general development of the Protectorate.

127. Several activities of the Game Department in which development is envisaged are considered under separate headings, namely, biological survey, fisheries, tourism and national parks. The department will no doubt take a prominent part in these developments, especially in their early stages. Activities directly concerned with game do not at present call for new development schemes, and therefore the only provisions made in Table 1 are for £1,000 per annum under normal expansion in column 3, rising to £1,500 in column 7, and for £2,000 non-recurrent expenditure in column 5. These are likely to be sufficient for the next ten years.

128. Looking forward to the ultimate fate of Uganda's wild fauna, it must be expected that the larger animals must be ruthlessly controlled and eventually exterminated from those parts of the country which are scheduled for full agricultural development. There will, however, be certain large areas given over entirely to wild fauna and flora, namely, the game reserves which at present comprise about 3,000 square miles or nearly 4% of the total land area (see Figure 7). Means will have to be found for restricting the animals to their own areas, perhaps by fencing on a large scale and by making the game reserves more attractive to the animals so that they will have less inducement to wander into the neighbouring agricultural lands. It may be desirable to provide special facilities for animals in the form of permanent water-holes, and even by growing food for them in order that the reserves may carry a larger head of animals, and therefore be more attractive to visitors. This, however, is looking ahead considerably further than the next ten years.

13. Swamp Development

129. Uganda includes some 2,500 square miles of swamp, about 3% of the total land area. It is mainly of two types, papyrus swamp which is permanently wet and used only for gathering materials for thatching and similar purposes, and reed swamps which tend to dry up at some times of the year and provide reserves of grazing used extensively in the pastoral areas. Projects to make better use of swamp lands have generally been referred to as swamp drainage. This is a misnomer because the object should be to conserve the supplies of water and use them to best advantage rather than to drain the water away as quickly as possible.

130. The best examples of swamp development are in Kigezi District where most of the swamps are long and narrow, being confined by steeply sloping hillsides. Consequently they lend themselves to development more readily than the much wider swamps prevalent in the central parts of the Protectorate. In one case, Kashambya swamp near Kabale, drainage has been accomplished during the last few years and now impressive crops and grassland are growing on what was formerly almost useless papyrus. This has been achieved by cutting a main drain from the lower end of the swamp up towards its head. The water table has been lowered and there may be unexpected results from factors which are not yet known. For example, the peat soil may shrink so rapidly through oxygenation that, after a period of years, the main drains may have to flow at a level higher than the agricultural land. Some investigation is required in this and other swamps, by measuring the run off and ascertaining how it is affected by drainage, by studying the subsoil with devices such as the "peat borer" in order to determine the depth of peat and on what it is founded, and by ascertaining the effect of the change from papyrus to cultivated plants on the local climate

surrounding the swamps. Such investigations could, perhaps, be undertaken by the investigational branch of the hydrological survey proposed in para. 48.

131. Various proposals have been made recently for bringing more swamps into use. Mr. A. E. Griffin has examined the problems and has proposed a method for drainage in blocks, leaving areas of natural swamp between drained areas in order not to affect the water table more than necessary. Another method would be to start operations at the head of a swamp rather than its foot and work downwards throughout its length. At the head drainage is undesirable and reservoirs might be made, ponded by earth bunds across the valley, perhaps two or three such bunds, each ponding a sheet of water a quarter to half a mile in length. These would be used for fish culture and as water supplies for domestic purposes and for irrigating the lower parts of the valley. The ponds would be drained alternately every few years on the system suggested in para. 58. Below the ponds parts of the valley would be drained by one or more longitudinal ditches and would be kept permanently under crops or grass leys. The initial productivity would be very high, but would of course decline after a few years. Shrinkage of the peat soil could, perhaps, be controlled by irrigation from above in order to maintain the water table close to the soil surface, and lower down the valley additional water control by fish-ponds might again be suitable. This is one of the principles of land use which are discussed later in connection with a pilot development scheme, and such a scheme would clearly be the place for initial experiments in swamp development. The effect of swamp development on malaria must, of course, be taken into close consideration, because while fish-ponds and drainage give opportunities for mosquito control, they may, in some circumstances, cause an increase of harmful species.

132. The majority of swamps in Uganda are Crown Land, and therefore the Administration could decide how they should best be used after they have been reclaimed. This applies even in Buganda, so that in that Province the adoption of improved systems of husbandry in the swamps would not be hampered by the Mailo system of land tenure. In many cases the area reclaimed might be large enough for economic use of agricultural machinery.

133. A problem related to those discussed above is that of obliterating swamps in or near townships in order to avoid trouble from mosquitoes. Several methods have been used in Uganda, ordinary drainage, filling with earth, and planting water-greedy vegetation such as some kinds of Eucalyptus trees. Such operations are liable to be extremely costly, so that any method which might quicken the work and reduce labour should be worth a trial. In Uganda many such swamps adjoin lakes; there are particularly troublesome examples in the town of Jinja where two swamps extend from bays of Lake Victoria into land which is scheduled for urban development. The floors of Uganda lakes are generally composed of soft mud, extending to an unknown depth, and this mud might be pumped from pontoons through pipes on to the swamps. This method is used in some places for dredging rivers and adding fertile soil to the neighbouring fields, and is said to be used successfully for filling swamps in the West Indies. It seems worth a trial in Uganda.

134. A financial allocation of £100,000 for experiments in swamp development during the next ten years is made in Table 1, column 5. This is only for initial capital works and their maintenance because it is assumed that plans would be drawn up and supervision effected by officers of the several departments concerned.

14. Co-operative Societies

135. In accordance with recommendations in the Secretary of State's Circular Despatch of the 20th March, 1946, Government has established a sub-department of the Agricultural Department for the supervision and guidance of co-operative societies. It is anticipated that the co-operative movement may have a large future in Uganda and will have functions both of economic advantage and educative value to the participants. The Registrar of Co-operative Societies is still in process of surveying the field so that it is difficult to forecast in which branches of progress co-operative societies will prove most valuable. Some agricultural marketing societies, co-operative supply societies and consumer stores are already operating, but experience to date has shown the need for very close supervision and much assistance in the early stages. One way in which the department may be able to assist is in providing capital beyond the capacity of newly formed societies. This may have particular importance in agriculture in facilitating the development of co-operative marketing and the introduction of mechanical implements, in fisheries by advancing funds for fishing boats and gear, and perhaps also in helping towards an improvement of the standard of housing, both in urban and rural areas (see para. 283).

136. A need is already apparent for the training of educated Africans in economic and commercial subjects, both to staff the junior grades in the Registrar's department and to serve as secretaries or officers of societies. The proposed commercial college in Kampala may provide the means for such training and as an interim measure use might be made of the facilities offered by Civil Reabsorption training centres. At a later stage it may be desirable to establish a special interterritorial training centre for co-operative workers.

137. This paragraph explains the entries in Table 1.—£300 in column 2 represents only a small part of the annual commitments as at the end of 1946 because financial provision was only made to cover a short period at the end of that year. The financial provision for a registrar of co-operative societies and one assistant co-operative officer is included for 1946 under the head of Agriculture. The establishment which it is intended to reach after a few years will consist of one registrar and one secretary at headquarters, three assistant registrars who will be posted to Provincial centres, 20 assistant co-operative officers who will be trained Africans mostly working in the Districts. There will be some junior assistant staff, and provision is included for travelling and transport, and miscellaneous expenses. This is expected to amount to an average of £10,000 during 1947–1956 (column 4), rising to £13,000 in 1957 (column 8). The figure of £70,500 in column 5 is made up of four items as follows: £3,000 for offices; £5,000 for initial equipment of the department; £12,500 for five European houses; and £50,000 as a fund from which loans can be made to societies, and to provide flexibility in the financing of this new department. If the latter sum is issued as loans bearing interest and amortisation at 5% the annual revenue in 1957 should be £2,500, which is entered in column 10.

15. Secondary Industries

138. It is clear that development, particularly such as is undertaken from public funds, must be concentrated during the next ten years on primary production from the resources of land and water rather than on secondary industry. Nevertheless, the development of some industries, especially those for processing primary products, is of great importance, not so much in the increase of wealth which will result, as in providing one of the main stimulants to the development of an internal economy. This must be an aim of any country where communications to the outside world are long and tortuous. It is in the establishment of such secondary industries that private enterprise can make its greatest contribution to development.

139. Already certain factory industries exist : cotton ginning, oil extraction, sugar extraction, coffee and tea preparation, flax and sisal processing, smoking tobacco manufacture, nicotine tobacco extraction, and fibre board manufacture. Important proposals are still under consideration for establishing others, *e.g.*, vegetable oil extraction and soap manufacture on a larger scale, and a textile factory. In all industrial development a big problem to be overcome is the 'building up' of a force of skilled and semi-skilled labour.

140. The project for establishing a textile factory at Jinja, using a part of Uganda's cotton crop as raw material has been under discussion for some years. Several firms of textile manufacturers have looked into this matter and correspondence has been continuous and protracted without any decision being reached. Meanwhile, in other parts of Africa, textile factories are being established in countries which would appear less favourable for the project than Uganda, where the large demand for cotton piece goods, the availability of raw cotton, and the distance of overland transport for exports and imports make local manufacture especially desirable. In such a territory as this, where cotton is the very backbone of the country's economy, Government should not be backward in giving a visible demonstration of its faith in the future of its greatest industry, for example by providing good facilities for establishing a factory, and ensuring cheap power (see para. 267).

141. The Protectorate Government, with prime responsibility for developing the country for the benefit of its indigenous peoples, needs to be circumspect in deciding on the extent to which large-scale enterprise by outside interests, either in primary or secondary industry, is desirable. At the present stage, however, the investment of outside capital is much needed and conditions must be attractive in order to induce it. Industrial enterprises require high commercial and industrial ability, and will involve those risks which must be faced by every business concern. Such risks Government should normally not shoulder alone, but there may be reasons for Government to participate in them. Therefore, when such matters arise for discussion, the principle might be considered of Government holding more than half the capital in certain new industrial enterprises.

142. No provision is made in this plan for Government financing of or subsidy towards secondary industries, because if such is needed in order to apply the principle suggested above, it would be suitable for financing from loans, and the new loan proposed in para. 303 could be increased accordingly. The only Government expense on secondary industry incurred at present is a contribution of £4,600 annually to the East African Industrial Research Board, shown in Table 1, column 2. The future of this enterprise is as yet uncertain, but it is assumed that the contribution will increase slightly to a total of £5,000 a year. This is provided for by entries of £200 in column 3 and £400 in column 7.

V. SOCIAL SERVICES*

143. The vicious circle which depends on lack of education—malnutrition–disease–inefficient work–low production—must be broken at some point. In Uganda, as elsewhere, there is difference of opinion as to which is the weakest link. In general there is a healthy disposition for each department to regard its own work as of high importance in the general effort to serve and improve the African, but the average African, like other human beings, does not show much desire for improvement—in fact, he has far too few wants of any kind for a country which hopes for increasing prosperity.

144. The branches of public service included in this chapter are heavy consumers of public funds, with health and education heading the list. This is as it should be, but I am of opinion that in Uganda there has been a tendency in the past for these two services to outrun others rather too fast. Therefore, with the object of the country basing itself on a more secure foundation of public finance by the end of the next ten years, I am reluctantly unable to recommend as much expenditure on health and education as the directors of the departments concerned would wish.

145. This part of the plan is based on the principle that services must be expanded during the next ten years throughout the Protectorate at a rate which exceeds the rate of population increase. Little more than this can be undertaken until it is proved that a general increase of production will allow heavy concentration on social services. Even so, existing commitments are so heavy that, allowing only for a small addition to services rendered, the proportion of total Government expenditure on social services as a whole increases slightly, from 28·3% to 29·2%, as a result of the plan.

146. In addition to the two main subjects, the new Department of Public Relations and Social Welfare will absorb considerable funds. The Uganda Museum, which might well develop into a cultural centre and also serve wide instructional purposes, is then discussed. Labour and Prisons follow, and a separate section is devoted to Approved Schools, for which departmental responsibility is not yet settled.

1. Health

147. The title of the department responsible is the Medical Department, but I agree with those who would prefer to have its name changed to Health Department in compliance with the general change of emphasis, which is prevalent in Uganda as in other countries, towards preventive medicine and health measures. The objects of the health and medical plan can be envisaged in three parts: investigation, health services, and curative medicine.

148. *Investigation.*—The principle that expenditure on public services can be made more efficient if a proportion of moneys available is devoted to investigation, is especially applicable in health affairs. The first line of attack must be the correlation of existing knowledge and the collection of new knowledge. In Uganda no scientific attempt has yet been made to ascertain how important are the various diseases of the African relative to other aspects of his standard of living, such as housing, sanitation and nutrition. The need for investigation is emphasised in several subsequent paragraphs, particularly in connection with the proposed campaigns against malaria, venereal disease and tuberculosis, and the nutritional survey.

* See Postscript, para. 417.

149. Another aspect of investigation is the collection of vital statistics. Uganda is better placed than some territories in knowledge about its population and in its organisation for collecting vital statistics, on account of the highly developed Native Administrations in most districts, and the system of dispensaries and district hospitals. There is, however, general agreement that figures available leave much to be desired, and no data exists on which to decide whether the probable errors of figures quoted in reports are of the order of 2%, 5%, or even 10%. Until there is a greatly improved organisation for collecting statistics of real use, with a higher degree of accuracy, and until that improvement is maintained over a period of years, it is impossible to assess changes even in the simplest variables, such as birth-rates, death-rates, immigration and emigration rates. Records of such changes are necessary in order to calculate the trends of population in different parts of the country and to assess the effects of different branches of public service. The collection of vital statistics would presumably become part of the responsibility of the territorial statistical office proposed in para. 211 but various activities of the Health Department would assist in obtaining data. At a later stage, it will become desirable to introduce registration in respect of all African births, marriages and deaths with the Registrar General's department.

150. *Health Services.*—Activities devoted to health and preventive medicine are required in the outlying parts of the Protectorate as much as, and possibly more than, in the more accessible parts. Consequently a high degree of decentralisation will be required. It is proposed that health centres should be established in as many saza and gombolola headquarters as possible and, later, even in smaller villages. These will not be independent units but will form an essential part of the dispensary system, which consists of a series of satellite units in charge of trained African staff, distributed around each district hospital. Attached to the health centres will be African men and women especially trained in preventive medicine and health work. It is hoped that the training centre for hygiene orderlies at Mbale will provide a nucleus of men for work in rural areas giving advice to the villagers on such matters as housing, latrine construction, and simple sanitation. At the same time it is hoped to build up a staff of women for house-to-house visiting, advising on such matters as cleanliness, infant welfare and domestic science. In aiming towards improved living conditions close co-operation will be necessary with the new Public Relations and Social Welfare Department.

151. In *curative medicine*, as contrasted with health work, a considerable degree of centralisation is necessary, because therapeutics have for many years been undergoing change due to the enormous growth of medical science. Both diagnosis and therapy now require an increasing amount of complex apparatus with personnel trained in its use. The cost of such apparatus sets a strict limit to its multiplicity so that to treat certain types of cases properly it is becoming more and more necessary to take people to centres which are adequately equipped. The flow of patients from dispensaries to hospitals should be countered by a flow in the reverse direction in order to relieve the large hospitals. This is now possible because certain diseases, which in the past required expert attention, can now be treated adequately by subordinate staff.

152. The degree to which the expansion of curative services can be applied in Uganda is entirely a matter of available funds, and unfortunately it is impossible to foresee during the next ten years a system which will provide modern medical attention to more than a small percentage of the population. Many hospitals require rebuilding or enlarging, and there is need for more dispensaries. Moreover, patients who cannot travel by foot or by bus require means of transport, and this will necessitate considerable expansion of the existing ambulance service. Experience has shown that lorries equipped locally as ambulances are cheaper and more suitable for present conditions in Africa than are vehicles specially built as ambulances for European or American conditions.

153. For many years to come the district medical officers will have to continue the dual function of supervising both curative medicine and health work, and in order to do this effectively they must travel for a large part of their time. As the cadre of African medical assistants increases

this will become easier, but in addition there is need for more European hospital managers at district headquarters to take a large part of the administrative work off the shoulders of the medical officers.

154. *Mulago hospital.*—Every health and medical service must have its central large hospital from which inspiration can emanate to outlying hospitals and to dispensaries and health centres in remote parts of the country. Herein lies the importance of the Mulago hospital and medical school at Kampala. It is intended to replace the present inadequate and out-of-date buildings by a new hospital on an adjacent site. It will be of the "pavilion" type which has proved so effective during the war on account of its adaptability and ease of enlargement, but the separate buildings may, perhaps, be of two storeys. The buildings will be connected by covered ways, and lifts and other mechanical devices which require maintenance will be reduced to a minimum. About 600 beds will be provided with up-to-date, but not luxurious, equipment and there will be proper quarters for European and African staff. There will also be hostel accommodation, perhaps arranged in the existing buildings, for out-patients who come from a distance and at present occupy many hospital beds which should be reserved for more serious cases.

155. The new Mulago hospital will be the central hospital for Uganda, and as such most of the funds required will be provided by Uganda, namely, £480,000. It will also be the teaching hospital for Mulago medical school, and for this purpose will be built and arranged on a rather more lavish scale, for example with greater spacing between beds, than would be required if it were not used for teaching. Therefore the hospital will cost, perhaps, 20% more than if required only for the purposes of Uganda. Since the advantage will accrue to other East African territories as well as to Uganda, it is hoped that an additional sum of £120,000 will be provided from the regional allocation of the Colonial Development and Welfare vote, so that a total of £600,000 will be available. The teaching functions will call also for more recurrent expenditure than would be needed for Uganda's own purposes, so that a contribution from the regional vote for upkeep as well as capital cost would seem reasonable.

156. The *Medical School* itself will be situated close to the hospital and be designed for an intake of sixty students annually, rising, perhaps, to eighty after ten years (the present intake is about fifteen to twenty). It will be affiliated to Makerere College and its estimated cost of £150,000 will, it is hoped, be provided by the central educational vote of the Colonial Development and Welfare fund, and therefore does not figure in the Uganda financial plan. The medical courses will be designed as at present to give a medical diploma which is not expected to be fully recognised by the General Medical Council for some years, but there will be facilities for those students with outstanding ability and character to proceed with their training in East Africa in order to sit for the London external M.B. It is also hoped that facilities will be made available for holders of the Makerere medical diploma to sit for the examinations leading to Membership of the Royal College of Physicians and Fellowship of the Royal College of Surgeons. There will be a three years' training course for African nurses and midwives, and accommodation for them will be provided for a maximum annual intake of about eighty.

157. The enlargement of the Mulago medical school is essentially an East African project. As affecting Uganda the provisions allow for a considerable increase in the present number of doctors and nurses in training and nearly all are expected to join Government service.

158. *Mental Hospital.*—There is need for a new mental hospital. The present arrangements for mental cases are extremely inadequate, and it is estimated that in the 10-year period a new hospital to accommodate 500 patients will be required. The number may be increased later to 1,000, so that the hospital should be designed to allow expansion, and should include agricultural land sufficient to afford occupational therapy for up to 1,000 people.

159. *Finance.*—As in other subjects the entries in Table 10 are provisional and may bear little relation to the expenditure which the department will propose when its revised plan for

development during the next ten years is complete. Entries are made against a list of major projects in order to justify the total allocations, and to ensure that the totals are reasonably adequate to meet the needs of health and medical services in relation to those of other branches of development.

160. In the opinion of the Director of Medical Services, the financial provisions of this plan are inadequate to meet the needs in a number of respects. But in order to keep the whole programme in balance, I am regretfully unable to recommend a larger expenditure than that indicated by the totals. In column 2 of Table 1, it is shown that the present recurrent charges of the department are 13·3% of total Government recurrent expenditure. Column 6 shows that, of capital and recurrent funds additional to the 1946 level of expenditure, £1,500,000, which is 9·4% of the whole, are allocated to health and medicine. The rough estimate in column 9 for recurrent expenditure after the 10-year period shows the proportion of the whole on health and medicine to have dropped to 11·8%. I regard this as more nearly a correct proportion than that prevailing at present, until it is proved that the country can carry greatly enlarged social services.

161. This paragraph explains the entries in Table 10.

A. *Contributions.*—£12,100 in column 2 is at present expended on grants to missions for maintenance of midwifery centres and relief of leprosy (£10,000), and contributions to research and information centres, including the Yellow Fever Research Institute at Entebbe, and the Bureau of Hygiene and Tropical Diseases. It also includes a grant for an interterritorial leprosy specialist and for the quarantine station at Zanzibar and other minor grants. The question of establishing a medical research institute in East Africa has been discussed from time to time, and if this project were to materialise it is likely that a substantial contribution from Uganda would be required. No provision is made, however, because it now seems more likely that the East African territories will rely for fundamental medical research on the departments of Mulago Medical School and Makerere College staffed in part by members of the Colonial Medical Research Service, under direction from the Colonial Medical Research Committee in London.

B. *Normal expansion.*—The normal recurrent expenditure in 1946 was estimated at £364,400 shown in column 2. Provision is made for increased normal expenditure of £15,000 in column 3, rising to £20,000 in column 7, chiefly to bring the department up to its approved establishment.

C. *New staff.*—£22,000 in column 4, rising to £38,000 in column 8, is a provision for new posts in the department. It is expected that many of these will be filled by African personnel trained at the enlarged Mulago Medical School, but there will also be a number of new European posts, including about thirty Nursing Sisters for Mulago Hospital, Nursing Sisters with Health Visitor qualifications for rural areas, Hospital Managers, and certain additional specialists.

D. *Training schemes.*—It is assumed that Mulago Hospital and Medical School will be the main centre for training medical and senior health staff, and that the expense of this will be borne largely by central Colonial Development and Welfare funds, and will not fall to Uganda. Special training schemes will be required, however, for hygiene orderlies and health workers, and for this a provisional allocation of £40,000 is made in column 5. It is assumed that staff for training centres will be found from that part of the departmental establishment which is at present administered under Civil Reabsorption.

E. *Mulago hospital.*—£480,000 in column 5 is the approximate amount already approved for expenditure on this project from the Colonial Development and Welfare Uganda allocation.

F. *New hospitals and dispensaries.*—The non-recurrent allocation of £100,000 in column 5 for all new buildings, hospitals, dispensaries and health centres, other than Mulago Hospital, is likely to prove inadequate. It is, however, all that can be found at present within the total regarded as suitable for medical and health purposes. If expenditure required on other items of the plan, such as nutritional survey, or disease surveys, can be provided from Colonial Development and Welfare Research Funds, a larger expenditure on hospitals might be justified.

G. *Ambulance service.*—£30,000 shown in column 5 is likewise inadequate to provide the full service which is hoped for during the next ten years, but the ambulances to be acquired within this figure will certainly produce a big improvement to the present service. No entries are made for maintenance because the principle has been accepted that this should be paid from Native Administration funds.

H. *New mental hospital.*—£7,000 in column 4, rising to £10,000 in column 8, is for staff and maintenance, and £200,000 in column 5 is for the capital cost of the building.

I. *Nutritional survey.*—This is regarded as a non-recurrent charge because the survey proposed, though it must be of some years duration, will not result in residual recurrent expenditure. The entry of £20,000 in column 5 is less than that envisaged in the former medical plan, but should be sufficient to collect information of high value.

J. *Disease surveys and campaigns.*—This special allocation is intended to cover work of an investigational character to find out what the problems are, in addition to instituting campaigns for their control. The diseases primarily concerned are malaria, venereal diseases and tuberculosis. Malaria is the most serious economic disease in Uganda. It is intended to employ a malariologist and a malarial engineer on short-term contracts, their recommendations to be carried out as far as possible by the Health Department and the Public Works Department in collaboration. The problem of venereal disease is second only to that of malaria, and the effort will be devoted primarily to expanding the facilities for treatment at existing hospitals and dispensaries. The effect of tuberculosis on the African population is not fully known, nor are the areas of maximum density of affected persons. The first need is for investigation to find out the position and how control might be instituted. New treatment centres to which cases could be referred from dispensaries and hospitals will certainly be required.

TABLE 10.—HEALTH

Subject	*1946 Recurrent*	*Normal Expansion 1947–1956* Average annual recurrent additional to 1946	*Development Schemes 1947–1956* Average annual recurrent during 10 years	*Development Schemes 1947–1956* Non-recurrent in 10 years	*Total 1947–1956* Normal expansion plus development schemes [cols. 3 (×10)+4 (×10)+5]	*Forecast for 1957 Annual Recurrent Expenditure* Residual from normal expansion	Residual from development schemes	Total recurrent [columns 2+7+8]	*1957 Anticipated Revenue from Development Schemes*
1	2	3	4	5	6	7	8	9	10
	£	£	£	£	£	£	£	£	£
A. Contributions ..	12,100	..	..	..	..	..	..	12,100	
B. Normal expenditure	364,400	15,000	..	..	150,000	20,000	..	384,400	
C. New staff	..	..	22,000	..	220,000	..	38,000	38,000	
D. Training schemes ..	..	..	..	40,000	40,000				
E. Mulago hospital ..	..	..	..	480,000	480,000				
F. New hospitals and dispensaries ..	..	..	..	100,000	100,000				
G. Ambulance service ..	..	..	..	30,000	30,000				
H. New mental hospital	..	..	7,000	200,000	270,000	..	10,000	10,000	
I. Nutrition survey ..	..	..	..	20,000	20,000				
J. Disease surveys and campaigns ..	..	..	5,500	65,000	120,000	..	7,000	7,000	
K. Housing	..	..	..	70,000	70,000	..	..	..	
TOTALS ..	376,500	15,000	34,500	1,005,000	1,500,000	20,000	55,000	451,500	

2. Education

162. In accordance with the principles advanced in the chapter on the fundamental problem, and in the remarks introductory to this chapter, an educational plan for the next ten years should lay the foundations for mass primary education, and a big development of secondary and higher education, during the decennium which will follow. During the drive for increased production it will not be necessary for every cultivator to be literate, but there will be need for many individuals with technical training. Therefore a sufficient increase must be allowed for in the immediate future to provide sufficient numbers of boys and girls educated to primary and secondary standards, to allow expansion in technical education of various kinds. The necessity of postponing plans for mass education, is much to be regretted, but mass education, together with a really significant increase of production, cannot be achieved with the limited funds available.

163. The base of the educational pyramid, consisting of primary education, needs widening; so does the middle section of secondary education; whereas the peak of higher education at Makerere College requires moulding to fit the needs of all the East African territories. One of the troubles at present is the wastage of boys and girls who fall while climbing the pyramid. The majority of those who go to school at all do not complete the primary stages, and of those who enter secondary schools many fall by the wayside. There is little provision for fitting them for the useful places which they should take in society. This could be provided by additional agricultural and technical education, not at the comparatively high level of Kampala technical school and Bukalasa agricultural school, but where possible at the level of the ordinary cultivator and craftsman For this purpose it will be necessary to expand and re-orientate vernacular education, that is, the first four years and, as funds permit, six years of schooling. Academic secondary education cannot stand still, but its aim in the immediate future should be to provide no more than an adequate supply of comparatively highly educated men and women for Makerere, for teaching, and for Government service and commerce.

164. In addition to developing agriculture and handwork as part of the ordinary primary and to some extent secondary curricula, which is a departmental matter involving little expenditure except in the training of teachers, it is proposed to inaugurate a network of actual agricultural and technical post-primary schools, to form an alternative to the academic kind of education which is the only form available at present. Suggestions in the previous published education plan for a large central farm institute at Bukalasa and twenty school farms attached to secondary schools and teacher training centres, do not meet the need any more than the need for technical education can be met by establishing new Government technical schools on a par with that at Kampala. The requirement is for more smaller and less ambitious practical schools for boys and girls of about twelve to sixteen years.

165. It has already been emphasised (para. 94) that intensive propaganda will be required to increase the output of work and to improve agricultural practice. The new emphasis on education should be designed to make the people receptive to such propaganda. Herein lies the great importance of what the African himself wants, and the need for making him or her want something more or better, and of showing him or her how to achieve it. In this connection a drastic change is required to eradicate the idea that agriculture is women's work If present ideas on this subject continue there is little doubt that the development of the Baganda and other Bantu peoples will soon be outpaced by the more hardworking Nilotic tribes of the north.

166. The change should come partly by increasing the emphasis on girls' education. Money spent on this, especially in practical subjects such as health, diet and agriculture, and on the training of women teachers in such subjects, should materially increase both the capacity and desire for manual output on the part of the men. Moreover, in connection with the fundamental problem of ultimately reaching a population which is stable in numbers, it should be remembered that women rather than men control the birth-rate. When women want and can obtain things other than children, the first stage towards stability of population will have been gained.

167. A commercial college for Uganda is proposed in order to provide training for future servants of the central and local governments and of commercial companies, and for those many Africans who wish to set up in trade and commerce. Training in a commercial college will itself be insufficient and, where possible, should be followed by, or combined with, a period of apprenticeship to some commercial house of high repute, so that to obtain the object there will have to be co-operation from the unofficial European and Asian members of the community who themselves are anxious to obtain better African staff.

168. The changed policy in education which is outlined above will require many more teachers, both men and women, trained on somewhat different lines from those at present adopted. Therefore an integral part of the scheme is the establishment of more teacher training institutions, possibly under Government control. This raises the much debated question of how far Government should take direct part in the education system, which up-to-date has been almost entirely in the hands of the missions. Government institutions are envisaged in certain spheres of education rather than in particular areas, but where education does not yet exist, for example, those areas designated for special development, the experiment of complete Government education might perhaps be tried.

169. On the financial side there might be a more definite understanding as to responsibility. In general it is suggested that Government should pay the salaries of all teachers; the owners of the schools, whether missions, Native Administrations or the Central Government, should pay for all capital and non-recurrent charges; the pupils should pay fees sufficient to cover maintenance other than salaries, this amount being a small proportion of the total recurrent cost of education.

170. This paragraph explains the entries in Table 11.

A. *Normal expenditure.*—£326,800 in column 2 includes part of the estimate in 1946 for the training of ex-askaris in addition to the Educational Department's recurrent estimate. £60,000 in column 3 rising to £110,000 in column 7 is the amount required to cover the increasing cost of increments and cost of living allowance to teachers now in the service and to revise their salary scales so as to keep step with the new Local Civil Service terms. Since nearly all the teachers are employed by the missions and not by the Government, the cost of living allowances are included under this departmental head instead of being bulked together with those for Government servants (para. 300). This high expense will be a serious drain on the educational allocations and involves no increase of the service rendered. The chief reason why this allocation is so large is that the great majority of existing teachers are recently appointed, and therefore are near the bottom of ascending salary scales. The fact that many appointments will remain in the lower levels of the scales, especially in the case of women teachers, on account of the rapid turnover of staff, has been taken into account.

B. *African education.*—The figures entered in columns 4 and 8 meet the requirements mentioned above that general education must increase more rapidly than population, and that emphasis should be laid on agriculture and technical aspects. The breakdown of the total for African education in columns 4 and 8 under the headings of primary and secondary (academic), agricultural, technical, commercial and teacher training, is merely an indication of the proportion of total effort which may suitably be devoted to these objects. It may be much altered when details of the new educational plan are worked out. On this scheme after ten years (column 8) there should be £38,000 additional recurrent funds devoted to the general plan for primary and secondary education. It is estimated very roughly that one group of schools in the educational pyramid, consisting of a number of primary schools feeding the one full secondary school, costs about £10,000 per annum in African salaries, and provides education for about 13,500 children in all. Allowing for a few additional European staff there should be enough money for at least three such groups educating more than 40,000 children additional to those now at school. In the absence of proper vital statistics there is no reliable estimate of the number of children of school age in the Protectorate, nor is it easy to ascertain the number attending unaided schools. But the additional number of about 40,000 to be educated under this plan represents an increase of at least 30% in the number of pupils (136,000 in all) now attending Government-aided institutions. At present it is estimated that between 5% and 6% of children of school age receive some form of education at Government-aided institutions. By the end of ten years, this proportion may be expected to increase to nearly 7%. This achieves the

object stated, but is a regrettably small increase. In addition to this the new agricultural and technical schooling for junior grades will by then be effective. The teacher training—£8,000 in column 4, rising to £10,000 in column 8, is intended to provide by the end of ten years five training units in order to produce enough teachers for the development plan. The teacher training will be developed as soon as possible so that the entry in column 4 is higher in proportion to that of column 8 than the corresponding entries under sub-headings (i) to (iv). In the whole of the African education scheme, except for teacher training, the figures entered include provision for salaries only. The other recurrent charges are assumed to be covered by fees in accordance with the principle in para. 169.

C. *Asian and European education.*—No details can be given until plans are worked out.

B and C. The non-recurrent allocation of £220,000 in column 5 is estimated to be sufficient to provide school buildings for the whole development scheme provided the new primary schools are very simple in design, and in large measure home-made, in order to be in keeping with the stage of education which the country has reached. It is suggested that a primary school should not normally cost more than £500, whereas secondary schools may amount to £5,000 or more. As announced by His Excellency the Governor to Legislative Council on 4th December, 1946, a private donation of £10,000 has been made towards the proposed Commercial College. It is hoped that this may be followed by other donations, so that more schools of all kinds may be provided within the total allocation from development funds.

D. *Housing.*—£80,000 in column 5 is a rough estimate of the requirements for new housing needed during the decennium. It includes 22 European houses at £2,500 each and 25 Asian houses at £1,000 each. Housing for Asians is required in this department because they will be recruited from overseas and therefore will not be part of the Local Civil Service.

The annual estimates of the Department include a considerable figure for special expenditure which in some cases may be increased. Much of this is made up of capital grants to missions for building new schools and is intended to be included in the block allocation of £220,000 in column 5. The other main item is for scholarships, and this is assumed to be distributed between the entries for normal expansion in column 3 and recurrent cost of the development scheme in column 4.

TABLE 11.—EDUCATION

Subject	*1946 Recurrent*	*Normal Expansion 1947–1956* Average annual recurrent additional to 1946	*Development Schemes 1947–1956* Average annual recurrent during 10 years	*Development Schemes 1947–1956* Non-recurrent in 10 years	*Total 1947–1956* Normal expansion plus development schemes [cols. 3 (× 10) + 4 (× 10) + 5]	*Forecast for 1957 Annual Recurrent Expenditure* Residual from normal expansion	Residual from development schemes	Total recurrent [columns 2 + 7 + 8]	*1957 Anticipated Revenue from Development Schemes*
1	2	3	4	5	6	7	8	9	10
	£	£	£	£	£	£	£	£	£
A. Normal expenditure	326,800	60,000	..	..	600,000	110,000	..	436,800	
B. African education :									
(i) Primary and Secondary (Academic) ..	..	..	24,000			..	38,000		
(ii) Agricultural ..	..	..	10,000			..	15,000		
(iii) Technical ..	..	..	4,000			..	7,000		
(iv) Commercial ..	..	..	4,000	220,000	820,000	..	6,000	90,000	
(v) Teacher training	..	..	8,000			..	10,000		
C. Asian and European education ..	..	..	10,000			..	14,000		
D. Housing	..	..	..	80,000	80,000				
TOTALS ..	326,800	60,000	60,000	300,000	1,500,000	110,000	90,000	526,800	

3. Public Relations and Social Welfare

171. The old social systems of Uganda are gradually disintegrating, and the new existence of the average African tends to lack both the common interest and the common aims which were formerly provided by the clans, age-groups and other tribal organisations. The younger generation is beginning to revolt against the dullness of life which is inherent in the intermediate stages of change. Particularly is this so among the many thousands who have been away in the army for several years and have become accustomed to army welfare and a much higher standard of living than that to which they have returned.

172. To meet the needs of this change in society a Department of Public Relations and Social Welfare comes into being in 1947 with the objects of undertaking welfare work, public relations and propaganda, and of co-ordinating activities of all the social services and productive departments towards the concerted aim of better conditions of life. Included in the new department's duties will be the encouragement of communal interests, including youth organisations and recreations, and the management of circulating libraries. In addition it will establish a probation system.

173. Work in all these directions will have to be experimental for a number of years, and so the department must be elastic and in some measure fluid in its organisation and activities. There will be much trial, and no doubt much error, before the methods are proved and a large expansion of social activities can be justified.

174. Welfare officers, both men and women, will work in close touch with all departments and with Native Administrations, collecting information about the African way of life and maintaining close touch with it. The officers will be aided by African staff, some of whom have already been trained at a new welfare training centre which is housed in temporary buildings near Makerere College. Its aim, in addition to training departmental staff, will be to provide short courses for chiefs, teachers, and other leaders of social life, in order that the influential men and women should enlarge their understanding of public responsibility.

175. Welfare centres will be established in places where they are sure to serve a useful function. Their value, except in large urban areas, is still doubtful in a country which is socially so lowly developed as that of Uganda, but clearly it is time that experiments were made. Whereas ultimately a welfare centre will need considerable buildings, with space for displays, a reading room, a café and the like, it is doubtful how far such facilities are required at this early stage. The people who will use welfare centres during the next few years may mostly be those few who have been away from Uganda during the war and have become accustomed to army welfare. Facilities for reading, lectures and classes, for games and other social diversions, can be provided in a simple building, and as each centre becomes popular it can very easily be enlarged. Therefore, three types of welfare centres are envisaged. The smallest kind would be built by the local authorities, with the aid of grants from Government of £100 towards the cost of a building and £100 for equipment; the intermediate type would cost about £600, and the large type for major centres about £900. It is desirable to have the small type designed so that it can be enlarged into the intermediate or large type by additions to the structure. Experience indicates that canteens attached to welfare centres are likely to make substantial profits which will go towards the upkeep of the centres and other welfare work. This suggests that the local Associations, whether tribal or otherwise, which are expected to collaborate with the Protectorate or Native Governments in taking charge of welfare centres, might extend the facilities offered for the purchase of every-day needs of members further than is usually the case in canteens. Thereby they might help to provide the local people with the amenities of life; profits would be increased, and welfare organisations might pay for themselves. Once it has been proved that welfare centres can be established on an economic basis there is no limit to the number which can be erected.

176. In addition to welfare centres it is proposed at an early stage to establish large hostels for African women in the two main urban centres of Kampala and Jinja. At present the many unmarried women in Government service, schools and other work, have nowhere satisfactory to live or to stay when travelling.

177. Visual propaganda and instruction has great opportunities in Africa, and with this in mind four demonstration teams, established on the lines of military propaganda units, have been formed to tour the country. Each team, in charge of a European Welfare Officer, is equipped with a portable stage and various exhibits and presents a programme drawn up in consultation with District Teams. A cinema van, attached to each demonstration team, will provide instruction and entertainment. I suggest that, as the organisation for visual propaganda expands, the still picture projected on to a screen may prove as useful as the cinema for many years to come. Even with British audiences instruction is often more effective with the still than with the moving picture. Still pictures give opportunity for the personal touch between instructor and audience, which the cinema can rarely achieve, and they have the great advantage of cheapness. Lantern slides to suit local conditions can be made overnight and can be projected on to a screen for as long as required, whereas even the best of agencies for producing cinema film cannot know all African audiences.

178. Publicity through print will be another main activity of this department. Posters and simple books in the vernacular will have an immense effect as soon as the public can read or understand pictures and diagrams. The emphasis during the next ten years should, in my view, be on productive activity such as agriculture, animal industry, forestry, fisheries and other local industries. Health and hygiene should likewise take a prominent place. In spreading information the small news-sheet published by the Government during the war has had a big success in the urban areas, and has now been enlarged and is published weekly in four languages.

179. If publicity is to have full effect there is obvious need for literacy on a large scale. Mass literacy may be regarded as the first step towards the ideal of mass education which, as explained in paragraph 162, will probably have to be postponed till after the next 10-year period. But clearly some progress should be made in the immediate future in providing adult education for those already literate. The establishment of welfare associations, both for men and women, will provide facilities, but the rate at which mass literacy and adult education can proceed will depend largely on the growth of a spirit of voluntary service in providing instruction and the willingness of those receiving instruction to contribute toward the cost.

180. Broadcasting, like the cinema, is a relatively new invention of civilisation and is apt to be extremely expensive. I suggest that it should not be undertaken on a large scale until far more is known than at present about its effects in African conditions. As a method of spreading propaganda it will certainly have great use if sufficient money is available. As a method of spreading culture its value is very doubtful until we know what kind of culture to spread. Except in the main centres of population, broadcasting may not pass beyond the experimental stage within ten years, and so I doubt whether much expenditure is yet justified.

181. This paragraph explains the entries in Table 12.

A *Establishment of department.*—

(i) *European staff.*—The allocation of £12,000 in column 2, rising to £14,000 in column 4, allows for the addition of several members to the staff list of sixteen in the initial establishment of the department.

(ii) *African staff.*—The entry of £7,000 in column 2, rising to £8,000 in column 4, provides for a large number of welfare assistants, demonstration teams, clerks, translators, etc.

(iii) *Other charges.*—£6,000 in column 2, rising to £7,000 in column 4, is considered adequate for travelling and transport, and a variety of incidental expenses. It also includes grants for home-craft training, courses at the welfare training centres, and preliminary experiments in adult education.

B. *Training school.*—£7,000 in column 3, which is already approved from the Colonial Development and Welfare vote, is for the building, including residential accommodation. £1,000 in columns 2 and 4 is for maintenance, but does not include staff which will be provided from those included above.

C. *Welfare centres.*—£50,000 in column 3, will provide a considerable number of centres on the scheme outlined in para. 175, and also the two women's hostels mentioned in para. 177. Part of the £50,000 already approved for social welfare from the Colonial Development and Welfare vote is in respect of these centres.

D. *Cinema equipment.*—Seven cinema vans have already been ordered at a cost of approximately £11,600. The grant approved from the Colonial Development and Welfare vote will in part be applied towards the cost. To cover this, and perhaps some more simple apparatus for visual propaganda and entertainment, £13,000 is included in column 3. £4,000 in columns 2 and 4 is the estimated cost of maintaining the cinema vans.

E. *Publicity.*—£5,000 in column 2, rising to £6,000 in column 4, is intended mainly for printing, to be undertaken when possible by the Government Press, but also includes special exhibitions of films, photographs and the like.

F. *Mass literacy and adult education.*—A block allocation of £10,000 is included in column 3.

G. *Housing.*—£20,000 in column 3 is for eight European houses at headquarters and at Provincial centres.

TABLE 12.—PUBLIC RELATIONS AND SOCIAL WELFARE

Subject	*New Development 1947–1956*		*Forecast for 1957*
	Average annual recurrent	Non-recurrent in 10 years	*Annual Recurrent*
1	2	3	4
	£	£	£
A Establishment of Department :			
(i) European staff	12,000	..	14,000
(ii) African staff	7,000	..	8,000
(iii) Other charges	6,000	..	7,000
B. Training school	1,000	7,000	1,000
C. Welfare centres	..	50,000	
D. Cinema equipment	4,000	13,000	4,000
E. Publicity	5,000	..	6,000
F. Mass literacy and adult education	..	10,000	
G. Housing	..	20,000	
TOTALS	35,000*	100,000	40,000†

* Made up from Table 1 : Column 2 £27,700; Column 4 7,300 = £35,000

† Made up from Table 1 : Column 2 £27,700; Column 8 12,300 = £40,000

4. Uganda Museum

182. This museum which is housed temporarily in the grounds of Makerere College, is a good foundation on which to build a cultural centre for Uganda. It has valuable ethnographic collections which are well displayed but is inadequately housed and staffed. It is possible that an East African Museums Association may be formed which will assist in avoiding overlapping of effort and therefore in the advancement of knowledge at each museum in a particular field. Thus the Coryndon Memorial Museum at Nairobi may specialise as at present on fauna and flora and prehistoric archaeology, while the Uganda Museum should not attempt to compete in these subjects but should itself continue on the present lines of ethnology and material culture. Each museum might, however, display representative collections of other subjects, obtained mainly by exchange with other museums in the association.

183. A Uganda Museum should not, in my opinion, be only a collection of specimens of historic or scientific interest, however well displayed. A part of its activities should look to the future rather than to the past, and should show by models and other visual illustrations, the improvements which are being or might be introduced in the African way of life. Exhibits on such lines would be of high value in training staff for the various public services as well as for general educational purposes. The best example I know of such a museum on a modest scale is the Stack Museum in Khartoum, consisting of a collection of exhibits on health and hygiene. It has been built up by the Health Department primarily for the purposes of teaching, but also for public information.

184. I envisage a Uganda Museum in Kampala consisting of two parts. One would consist of historic and scientific exhibits concerning the African way of life as it has been, and would include research in this subject. The other would be for informing and instructing the public on improved ways of life, using methods similar to those of the Stack Museum in Khartoum. Each department of public service might have space allotted to it for exhibits of its own activities: some might be relief maps showing, for example, improved methods of land use; others would be models and diagrams of village lay-outs, houses, latrines, water supplies, diseases and their vectors and the many other subjects where improvements are needed. Whereas the ideas required for the exhibits would be provided by the department concerned, the work of making them would be done by the museum's staff. The art school at Makerere would have little difficulty in training the African technicians required.

185. A museum with a dual function such as that suggested above might require dual control. The first function, including research, could be accomplished best under an independent board of Trustees such as that which controls the present museum. The second function might best be a direct responsibility of Government, and in such case the new Department of Public Relations and Social Welfare would seem to be the appropriate authority. It is assumed that a close connection between the museum and the Uganda Society would be maintained, and perhaps the new museum would provide a suitable home for the Uganda Society's library, which might be a suitable repository for the historical records and archives now inadequately housed in the basement of the Secretariat.

186. With these objects in view the first need of the Uganda Museum is an adequate building including display halls, a lecture hall and study rooms, and two permanent European members of staff, one for each section, with technical assistants to prepare exhibits. Accordingly an allocation of £30,000 for non-recurrent expenditure is shown in Table 1, column 5, of which £25,000 is for the museum and £5,000 for two European houses, and £3,000 per annum in column 4, rising to £4,000 in column 8, in addition to the £800 spent in 1946 (column 2), is included for staff, maintenance and materials.

5. Labour

187. Although the central parts of Uganda near the north shore of Lake Victoria are for the most part well populated, their people are disinclined to engage as labourers, so that employers depend very largely on tribes at a great distance, especially on the people from Ruanda-Urundi who come from that territory for short periods of work, and on the Nilotic peoples of the West Nile District. Not only is a high proportion of export production from the central parts of Uganda dependent on this itinerant labour, but a good deal of food in Buganda Province is likewise dependent on labour employed by Baganda landlords.

188. Labour routes are being organised from each of the main sources. The most important is the south-west labour route from Ruanda-Urundi which starts from two main centres on the River Kagera, namely, Merama near the Kigezi border and Kyaka near Bukoba. From these places the two routes converge on Masaka and then continue by the main road to Kampala and Jinja. The total labour force passing along the route each year amounts to some 100,000 arriving and less than half this number returning, and is difficult to control except by inducing people to pass through staging camps. Special difficulties are met with in the hospitals along the route at Masaka and Mbarara, where wards have to be set aside for the sole purpose of Banyaruanda, many of whom are suffering from malnutrition and debility rather than from recognisable disease. These should be overcome when camps are established at these two centres, if possible with dispensaries in charge of medical assistants who would ensure that only really ill people are sent to hospital. It is intended to establish in all 14 labour camps. There will be five large ones, at Merama, Kyaka, Mbarara, Masaka, and Kampala, and smaller camps about 20 miles apart between them. Those at Merama and Mbarara are already complete. The other labour route from West Nile District is already organised with a camp at Arua, to be taken over shortly, and others at Pakwach, Butiaba, and Masindi Port. This route is more easily controlled because the bulk of the labourers travel by the steamers of the Kenya and Uganda Railways and Harbours.

189. It is expected that the special problem of the labour routes will soon be solved, but labour will become progressively more important in the drive for increased production and welfare, so that the department is likely to have much enlarged functions in future. For example, new problems are developing in connection with labour in urban centres. It will soon be necessary to fix minimum wages and conditions of work and the distribution of labour will require assistance by establishing labour bureaux in the main towns. To meet these needs, it is proposed to establish district offices of the Labour Department in Kampala, Jinja, Masindi and Masaka, the two former being the main centres of distribution, and the two latter main centres where immigrant labour congregates.

190. Trade unionism is another subject with which the department will be concerned, although it may be some time before trade unions can be established satisfactorily in order to achieve the objects which they serve in Britain.

191. This paragraph explains entries in Table 13.

A. *Normal expenditure.*—£400 in column 3, rising to £500 in column 7, is intended only to cover the increased expenses of the department at its present level.

B. *New staff.*—£3,500 in column 4, rising to £4,500 in column 8, provides for five new European officers, including a trade union labour officer, and also for African labour inspectors. In addition, it is intended to have a senior medical officer, who will be seconded from the Medical Department.

C. *Other charges.*—£1,000 in column 4, rising to £1,500 in column 8, is for travel and transport and incidental expenditure required for the new staff.

D. *Organisation of labour routes.*—£4,500 in column 4, rising to £6,000 in column 8, provides for the maintenance of the labour camps mentioned above, and for food for immigrants. £50,000 in column 5 provides for three main camps on the south-west route, Kyaka, Masaka and Kampala, at a cost of about £10,000 each, and for up to ten intermediate camps at approximately £2,000 each.

E. *New office and equipment.*—£1,000 in column 5 will probably be sufficient for a labour office at Masaka Other district officers will be housed at administrative headquarters.

F. *Housing.*—£15,000 in column 5 provides housing for six European staff.

G. *Recruiting and attestation fees.*—It is expected that direct revenue from these sources will amount to nearly £1,000 by 1957.

TABLE 13.—LABOUR

Subject	1946 Recurrent	Normal Expansion 1947–1956	Development Schemes 1947–1956		Total 1947–1956	Forecast for 1957 Annual Recurrent Expenditure			1957 Anticipated Revenue from Development Schemes
		Average annual recurrent additional to 1946	Average annual recurrent during 10 years	Non-recurrent in 10 years	Normal expansion plus development schemes [cols. 3 (×10) + 4 (×10) + 5]	Residual from normal expansion	Residual from development schemes	Total recurrent [columns 2 + 7 + 8]	
1	2	3	4	5	6	7	8	9	10
	£	£	£	£	£	£	£	£	£
A. Normal expenditure	13,000	400	..	..	4,000	500	..	13,500	
B. New staff ..	..	..	3,500	..	35,000	..	4,500	4,500	
C. Other charges ..	..	..	1,000	..	10,000	..	1,500	1,500	
D. Organisation of labour routes ..	..	..	4,500	50,000	95,000	..	6,000	6,000	
E. New office and equipment ..	..	..	..	1,000	1,000				
F. Housing ..	..	..	..	15,000	15,000				
G. Recruiting and attestation fees ..	..	..	..	..	..	..	..	..	1,000
TOTALS ..	13,000	400	9,000	66,000	160,000	500	12,000	25,500	1,000

6. PRISONS

192. The Prisons Department has a programme for new buildings and improvements which are overdue. The only prison which is up to the required standard is at present the central Luzira prison at Kampala, and even this is in serious need of new warders' quarters. New prisons are required at Mbarara, Masaka, Jinja, Mbale, Moroto, Fort Portal and possibly Arua. The first two are already on schedule for building in 1947/1948. Jinja and Mbale are difficult on account of the lack of suitable sites within the township areas, so that one or both might be replaced by a new prison at Tororo where communications are good, the land problem is less acute, and satisfactory building materials are available. Much of the prison building may be undertaken by the prisoners themselves when instructors are available. There is no need for very large expenditure because camp life is prefe able for prisoners to life in walled enclosures. Some additional staff for the Prisons Department is required in addition to improved quarters both for prisoners and warders.

193. Farming as an activity for prisoners is already important and might, perhaps, be increased in such a way as to help agricultural improvements in many parts of the country. For example, the central prison farm at Kitalya might be a suitable place for trying out mechanical implements with the object of increasing the output per agricultural labourer. Supervision can obviously be more complete under conditions of prison labour, provided there is adequate advice from agricultural experts. The same might apply to Native Administration prison farms which are admirably organised in several districts under advice from agricultural officers. They could be enlarged

appreciably without increasing the number of prisoners, so that the system of husbandry adopted would come more closely into line with the improved system applying to each district as recommended by the Agricultural Department. In other words, the average area cultivated per prisoner could be increased and prison farms could serve as demonstrations which local people would be invited to visit.

194. In Table 1 provision is made for normal expansion based on the existing establishment—£1,000 in column 3, rising to £1,500 in column 7; and for new staff—£2,000 in column 4, rising to £2,500 in column 8. The capital expenditure required for the above programme is provided by £125,000 in column 5.

7. Approved Schools

195. There has never been any proper provision in Uganda for juvenile and adolescent delinquents. The question is under discussion at present to decide the best form such a service should take and whether it should be in charge of the Education, Welfare, or Prisons Department. The aim will be to establish two centres, one a Borstal section under firm control, the other an approved school. It will be necessary to keep the inmates of each section apart, but the two might be built on the same estate and share supervision from European officers.

196. This project is entered in Table 1 as a separate development scheme with recurrent expenditure of £3,000 per annum in column 4, rising to £5,000 in column 8, and £15,000 in column 5 for capital expenditure on buildings, including two European houses. This should be sufficient for perhaps 100 boys in each of the two sections. The proposed organisation of a probation service mentioned in para. 172 as part of the new Public Relations and Social Welfare Department, will clearly have to co-operate closely with the approved schools.

VI. COMMON SERVICES

197. Some subjects included in this chapter are basic to the development plan, for example, statistics, transport and communications, hydro-electric power, urban development and housing. Others which are not normally regarded as part of development are heavy consumers of public funds and therefore need substantial provision. Among these are law, defence and police, cost of living allowances, pensions and gratuities, and public debt.

1. Administration, Law and Defence*

198. No attempt has been made to examine closely the needs for expansion of Administration, nor the needs of Law and Defence services; but in order to present a picture as complete as possible in relation to development measures, entries are made against these subjects in Table 1, column 2†, and a combined allocation of £30,000 is made for the expansion of recurrent expenditure in column 3, rising to £50,000 in column 7. This does not involve a large proportionate increase, because it is expected that expenditure on defence, which has been abnormally high during the war, will be materially reduced. Saving under this heading will be available as an addition to the entries in columns 3 and 7 for administrative services, which will be the backbone to the whole development plan.

199. In administration there are two major schemes for capital expenditure, namely, new or improved offices for the Central Government, and new Provincial headquarters for the Western Province. There is also need for new Provincial offices for Buganda.

200. *Central Government offices.*—Entebbe and Kampala are at present separated by 25 miles of winding road and by an overburdened telephone system. When the new road is complete (para. 238) the distance will be reduced to 20 miles of fast road with bitumen surface, and the underground trunk telephone (para. 266) will allow direct dialling between the two places at all times.

201. The possibility of moving the seat of Government from Entebbe to Kampala has been much discussed. The object is to allow more frequent and easier contact between officers of the Central Government and the commercial interests and some Government departments which are centred in Kampala, and to overcome other problems inherent in the community at Entebbe, which includes only one European who is not a Government official. Clearly the contacts between the Government and commerce must be much closer than at present, and a movement of the centre to Kampala would be a great advantage. It is questionable, however, whether the advantages are worth the cost, when that cost is balanced against the rest of the development plan. In the earlier plan for post-war development £100,000 was earmarked for central offices

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* *See* Postscript, para. 418.

† The entry of £503,200 against Administration covers a number of services which appear separately in annual estimates. They include: The Governor, Accountant General's and Administrator General's Departments, Coast Agency, Audit Department, Customs and Excise, Income Tax, Native Affairs, Provincial Administration, Secretariat, together with sundry amounts under Miscellaneous and Emergency Services.

in Kampala, but a revised estimate of the requirements suggests that the cost would be much larger, probably at least £250,000. If the seat of Government were moved to Kampala, Entebbe would continue to be used as a dormitory town on account of the large capital already invested in houses and the difficulty of erecting new ones at Kampala. This would apply not only to senior staff, but also to considerable numbers of junior European staff and Asians. Much time and expense would be spent in travelling to and fro in morning and evening. It has been estimated that the cost of moving European and Asian staff back and forth would be about £10,000 per annum. The problem of African staff is less acute because many live some miles away and are mobile by bicycle; but most of them would be faced with greatly increased journeys or moving nearer to Kampala which would be very difficult on account of the increasing congestion.

202. The alternative is to build some new office blocks in Entebbe and others in Kampala for which £100,000 would probably be ample, and to induce commercial interests to use Entebbe more than at present. Among new offices at Entebbe might be a block for renting to commercial organisations, the larger of which might wish to open liaison offices at the seat of Government. The fact that the main airport will remain at Entebbe in any case is another inducement for commercial interests to develop there. The establishment of a hotel, or residential accommodation at the club, would likewise help, and is long overdue. It is certainly unique, but highly inconvenient, for a territorial capital and chief airport to have no hotel or restaurant accommodation within 20 miles. Moreover, with the increased Government staff, the Entebbe community should be large enough to support a garage and European shops, thereby introducing further unofficial elements. There is plenty of room because the Entebbe peninsula is almost entirely Crown land and extends to approximately nine square miles.

203. In reaching the decision it should be remembered that many modern States have decided to establish headquarters of their governments at some distance from commercial capitals. Examples are the United States, India, Australia and South Africa. Uganda has achieved this by an accident of history, and might at some future date regret a change made now. Since in any event considerable expenditure must be incurred on new or improved offices, provision is made to the extent of £250,000 capital, and of £7,000 in column 4, rising to £10,000 in column 8, for the possible transport of European and Asian staff between Entebbe and Kampala.

204. *New headquarters for the Western Province.*—The Western Province as reconstituted in 1947 includes the three kingdoms of Bunyoro, Toro and Ankole, and one District where administration is direct, namely, Kigezi. At present these are administered from the old Provincial headquarters at Masindi, which is handy for Bunyoro, but very distant from the other three Districts. Accordingly consideration is being given to the site for a new Provincial headquarters, and this depends in some measure on the plan for improved communications. The choice has been narrowed down to Fort Portal, Mbarara, or some place between the two near the District boundary. The cost of building a new provincial headquarters is likely to be at least £55,000 which would include £10,000 for offices, £25,000 for ten European houses and perhaps £20,000 for the general layout, drainage, etc. Accordingly financial provision has been made although there is no need for an immediate decision.

205. *Provincial offices, Buganda, and other offices.*—The present office is old, out-of-date, and inadequate in size. Accordingly, it requires either additions or complete rebuilding. Provisional allocation is included of £10,000. Another £10,000 is included for offices which may be required elsewhere.

206. *Housing.*—While provision is made for expansion of the departments concerned, no detailed plans have been worked out. New housing will certainly be needed, and therefore the entry in column 5 includes provision for thirty European houses, that is, £75,000.

207. The total of £400,000 shown in Table 1, column 5, is thus made up of the following —

Central Government Offices ..	£250,000
Western Province Headquarters ..	55,000
Provincial Offices, Buganda	10,000
Other Offices	10,000
Housing	75,000
	£400,000

2. Police

208. It is expected that the expansion of Police services in the Protectorate will be largely achieved through supervision of the Native Administration Police and not by wide extension of the Protectorate Police Force, whose activities are, apart from very serious crime, confined to urban areas. To achieve an improvement to the Native Administration Police the department will need additional staff and possibly training centres in each Province.

209. The Protectorate force is in need of adequate housing at all stations, and although progress has been made with a comprehensive plan to replace temporary rondavels by permanent buildings everywhere, there is still much to be done. Further, new police stations are necessary, particularly in outlying districts.

210. Expansion of staff and other charges are provided by £7,000 in column 3, rising to £10,000 in column 7. £200,000 in column 5 is for the building programme, including houses for new European staff as required. A detailed plan has been prepared to spend £137,000 of this amount within the first five years. It will include new or additional quarters for N.C.Os. and constables at over twenty stations throughout the Protectorate, together with quarters for African sub-inspectors and new premises for, or additions to, sub-police stations in a dozen different areas. Extensions to the Police Lines at Nsambya, where the whole of the Kampala force is housed, must also be envisaged within the next few years, and this will involve expenditure of about £30,000.

3. Statistical Office

211. Nearly every subject considered in this report involves the collection and analysis of statistical data, but there has never yet been an adequate organisation for advising on the data to be collected, or for analysing this information and making it available in useable form for planning and administrative purposes. The Interterritorial Research Statistical Office in Nairobi which was formed in 1926, was short-lived and at the end of six years was closed completely as a result of the 1931 slump. It is now being re-established as an East African Statistical Section and will consist of a basic organisation in each of the three territories as well as a regional headquarters. Besides providing the basic organisations which will provide a minimum service the section is planned to permit each Government to expand its own statistical service to whatever size it wishes. These auxiliary services will be paid for by the individual Governments and not by contributions to the inter-territorial section. Both the regional and territorial offices must be better staffed and equipped

than anything which has existed to date, if full advantage is to be taken of the planned expansion of public services now possible.

212. It is understood that the East African Statistical Section will be adequately staffed with several qualified officers and assistants and an office with a qualified statistician will be set up in Entebbe. At headquarters the section is equipped with Hollerith and other machinery and should therefore be capable of handling on an interterritorial basis the large quantities of data which will be supplied to it by the territories.

213. I suggest that, by the end of ten years, the staff of the Uganda statistical office should consist of three fully qualified statisticians, of whom two should be experts in economics as well as statistical methods, and the third an expert in experimental statistics and perhaps agriculture. They should have subordinate staff, perhaps a total of six, either Asians or specially trained Africans, some of whom would be posted to the departments such as Health, Agriculture, Education, Labour, as well as to the Administration, all of which collect quantitative information and have particular need of properly compiled statistics for planning purposes. The European staff should, from time to time, travel through the territory in order to advise on the information to be collected and to supervise the methods of collection.

214. In Table 1 the 1946 figure of £2,600 (column 2) is the present contribution from Uganda to the East Africa Statistical Section for the basic organisation. It is assumed that the contribution will continue at about the same level in spite of a much enlarged central office with extra machinery, because the additional expense of this office appears suitable for financial provisions from the Colonial Development and Welfare regional vote. £4,000 in column 4, rising to £5,000 in column 8, is for the increase in the Uganda statistical office in accordance with the outline above.

215. £15,000 in column 5 provides for the building of an adequate office at Government headquarters, and for the purchase of extra calculating machines and other essential equipment. It does not include provision for Hollerith or other complicated machinery which will be situated at regional headquarters.

4. Transport

216. In a country at Uganda's stage of development cheapness of transport is more important than speed, except for certain passenger routes. Therefore water is the best form, where available, rail the second best, and road the third. The country is well provided with navigable waters, and has a railway to Kampala and to Soroti with possibilities of extension to the west and north respectively. The object must clearly be to get produce from the roads to water or railway by the shortest routes.

217. The general situation of transport is shown in Figure 8. A distance of thirty miles from railway stations and ports has been taken as the effective distance in a bee-line in showing those parts of the country which are already adequately supplied with heavy transport, or could be supplied by extensions of the railway system.

218. The fact that a large part of the country already has facilities for water or railway transport does not imply that there are no difficulties in those areas. For example, Bukakata Port near Masaka, which at present takes a large part of the produce from the southern and western parts of the Protectorate, is difficult to operate at times of low lake level, and thus tends to form a bottle-neck in the transport system. Again, produce from the north-west, bound for railhead, and transit traffic moving west to the Congo or north to the Sudan suffer four handlings on the route which

includes steamers on Lake Albert and Lake Kyoga and a road link between the two. Water transport on Lake Kyoga is inconvenient also, because at times of low water level the ports are difficult to operate, and under the natural hydrological regime low water usually coincides with the export season for cotton. Consequently produce tends to pile up at the steamer ports at peak periods and is apt to suffer serious depredation from pests. It is only in the more central areas of Buganda and of the Eastern Province near to the railway where facilities for heavy transport can be claimed to be truly adequate.

219. Apart from difficulties in the areas within thirty miles of the Kenya and Uganda Railways and Harbours, the map shows two large blanks, one comprising most of the western part of the Protectorate, the other the north-east. The western area is the more important because it includes some of the most productive country. At present all produce from Toro District has a long road haul of over 200 miles to rail-head at Kampala. From Kigezi and Ankole Districts there are more than 100 miles to lake transport either at Bukakata or Kagera Port in Tanganyika.

220. The copper deposits at Kilembe on the slopes of Mount Ruwenzori, and the possibilities of manufacturing cement from the limestone at Mohokya introduce a special problem of transport. Neither of these important assets is likely to be extensively developed until satisfactory facilities are available for moving quantities of heavy material. Whether or not the Kilembe copper could even then compete with world markets, or the products from Mohokya with imported cement, is still an open question, but if private enterprise is prepared to proceed with these schemes the advantage to Uganda would obviously be great and efforts should be made to provide the necessary transport.

221. It is concluded that if the basic object of this plan is to be achieved, namely, a big increase in production during the next ten years, large capital investment in heavy transport is essential. Water transport and railways are the responsibility of the Kenya and Uganda Railways and Harbours. They do not involve financial obligation by Uganda except that the loss on any new railway extension would have to be guaranteed. No provision for such a loss can be made until the economics of railway extensions have been subjected to further enquiry, and therefore no financial entries are made in Table 1.

222. The question of railways versus roads in providing the requisite facilities for heavy transport has been argued in every pioneer country, and a full exposition has been made by J. E. Holmstrom (1934 "*Railways and Roads in Pioneer Development Overseas*"). Though his arguments were based mostly on statistical data prior to 1930, they are still applicable today, with modifications. No attempt has been made in the following paragraphs to assess the critical point depending on traffic density when a railway is likely to be more economic than road transport, taking all economic factors into consideration. This assessment would, of course, have to be made, together with an estimate of expected produce and other traffic, before embarking on the rail extensions which are suggested below. The case against rail extensions in Uganda is sometimes supported by reference to the fact that certain extensions in Kenya and Tanganyika have failed to pay, but I suggest that this comparison is misleading.

(*a*) *Water Transport*

223. The problem of water transport would be much eased if the levels of lakes were controlled according to the scheme summarised in paras. 267 to 275. At present the difficulties are more acute on Lake Kyoga than on Lake Victoria. On Lake Victoria, forecasting of variation in level would enable arrangements for transport to be made in advance, whereas on Lake Kyoga a modified flow of water down the Nile from Lake Victoria, discharging more at one time of the year than another, might enable the level to be raised to its maximum at times when the steamer services need to be most active. Whether or not lake control is achieved in the near future, it will be a relatively simple matter involving but little expenditure, to increase the service of tugs and lighters on both

these lakes up to the numbers required. But the transport of all produce immediately at peak periods is unlikely ever to be economic, so that an improvement to the Kenya and Uganda Railways and Harbours must be accompanied by the provision of storage facilities at the ports. Whether such facilities should be provided by the Kenya and Uganda Railways and Harbours or otherwise is discussed in para. 91.

224. The development of transport on Lake Albert and the Nile downstream to Nimule is uncertain until plans are defined concerning the creation of a Lake Albert reservoir. If a dam is constructed at Nimule it should be possible in future for large steamers to ply direct from there to the southern end of Lake Albert without transhipment. In such case Butiaba and the ports on the Albert Nile would have to be reconstructed to provide for a higher water level, subject to variations. In any case it is highly desirable to establish an additional port at the southern end of Lake Albert, probably at Ndaiga Bay where alteration of lake level would cause less difficulty than elsewhere on account of the steeply shelving shore-line. This port will need to be connected by road with Fort Portal (see para. 244).

(b) Railways

225. The present railway system serving Uganda leaves much to be desired. The main line to Kampala, though it has greatly helped development, is unduly tortuous and duplicates a pre-existing main route of water transport from Entebbe, Port Bell and Jinja to Kisumu. With the idea of reducing mileage, a new alignment of the railway has been surveyed between Nsinze and Jinja, but it is suggested that this improvement should take low priority compared with extensions. The existing extension north-west from Tororo to Soroti has been criticised because it was aligned in such a way as to miss by several miles the main trading centre of Mbale, and to terminate at an unnecessary distance from Soroti town.

226. Two extensions to the railway system have been in mind for many years, one westward from Kampala, the other north-west from Soroti. Their effect would be in large measure to fill the blanks in the system of heavy transport shown in Figure 8.

227. The *westward extension* is much the more important for the purposes of Uganda. An alignment through Mubende, south of Fort Portal, and thence along the flats west of Lake George to Kasindi on the Belgian frontier was surveyed before 1930, when the railway was built to Kampala, with the idea that it might ultimately link up with an extension of the Congo railway system from Stanleyville, and so provide a through route across Africa. The possibility of a link with the Congo railways in this region is now more remote than formerly, and consequently this extension has to be considered as an issue in which no country but Uganda is concerned.

228. The first part of the proposed extension from Kampala to Mubende was examined in detail by a committee which reported in 1931. The increase of agricultural production from Mubende and Toro Districts was at that time expected to cause the railway extension to earn substantial profits within eight years of construction. Although doubt was thrown on the Committee's findings, it appears that the estimate of increased production has in fact been considerably exceeded. From an agricultural point of view, however, it is not so much Toro District as Ankole and Kigezi, and the hinterland of Masaka District, from which large increases in production are now expected. Moreover, Toro would be in part provided for by the new port at Ndaiga Bay on Lake Albert mentioned above.

229. In order to cater for the two requirements of the agricultural areas of Ankole, Kigezi, Masaka and Mubende, and also for the mineral developments near Mount Ruwenzori, it seems best to envisage a railway extension in the shape of a letter Y. The base would run north of Lake Wamala and at some convenient point, perhaps at or near Mubende, it would divide into two, a northern branch running to Kilembe, and a southern branch swinging southward in an arc to Mbarara, or preferably still further, to within easier reach of the Kigezi highlands.

230. A route for the southern branch* has been examined by the Kenya and Uganda Railways and Harbours, which report that no major engineering difficulties would be encountered and that the earthworks needed would be moderate. If construction is undertaken in the immediate future at the high prices now prevailing, and if the extension were to be laid in new material with track of 60 lbs. per yard, which is adequate for axle loads up to 13 tons, it is estimated to cost about £14,000 per route mile. The length of the line from Kampala to Mbarara would be about 200 route miles, so that the total cost, including a sum of £250,000 for the additional power and rolling-stock required to work the traffic, would be £3,050,000. The northern branch to Kilembe would involve about another 125 miles which, on a similar estimate, would cost nearly another £2,000,000.

231. The investment of £5,000,000 would be difficult to justify for this rail extension unless there is certainty of traffic on a large scale, both from the mineral projects near Ruwenzori and from agricultural production all down the line. Therefore decision must be postponed until either the traffic is certain or the costs of construction and rolling-stock are reduced appreciably below their present level.

232. Meantime a number of other decisions concerning development in the western area have to be taken in the near future, and must depend in part on the future transport system. For example, the headquarters of the Western Province, which now comprises Bunyoro, Toro, Ankole and Kigezi districts, may have to be moved from Masindi. If the railway is ultimately extended westwards, these headquarters should clearly be near the system rather than at a place which may be far from the line. In deciding such questions it may be wise to assume that the railway will in fact be extended some time within the next ten years, more or less in accordance with the routes marked in Figure 8.

233. It has been suggested that, in order to ease present transport difficulties and to test the demand for railway traffic, so that reasonably accurate estimates could be made of the economics of the rail extension, heavy road transport should be run along the route designed to be followed. This proposal has much to commend it, but in the case of the proposed route *via* Mubende considerable difficulties would be entailed, as follows:—

A. If road transport is to test the potential railway traffic effectively, it would be necessary to usurp the existing interests in goods and passenger transport carried by lorry and bus between Kampala and Mubende and between Kampala and Mbarara *via* Masaka.

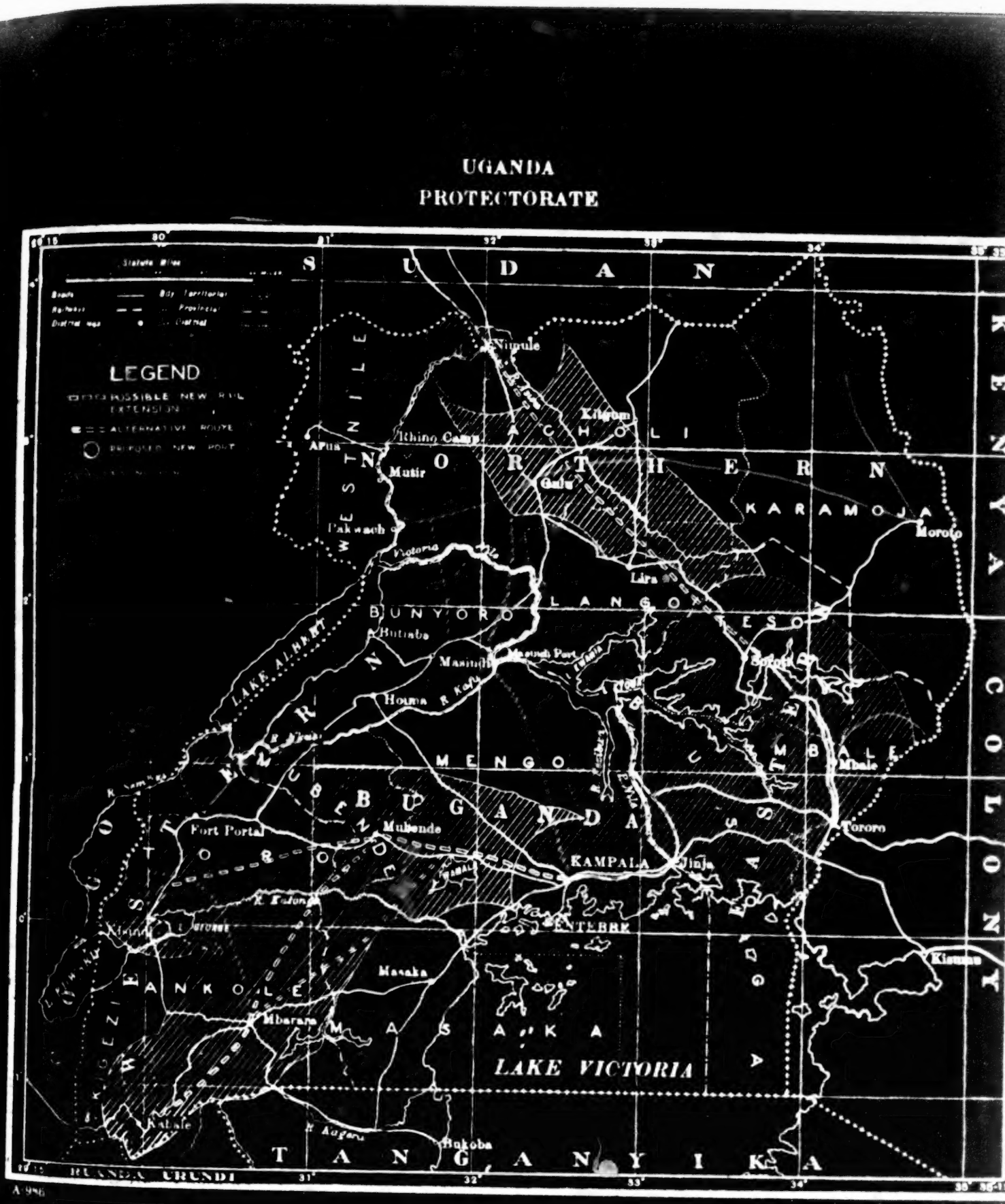
B. The proposed railway would run from Mubende to Mbarara along a route not at present covered by a road, because the existing main roads have developed on a system which radiates from Bukakata Port and Kampala.

C. If, in order to overcome B above, a new main road were built from Mbarara to Mubende, it would be highly uneconomic to take produce from Kigezi, Ankole and the hinterland of Masaka districts by road to Kampala *via* Mubende rather than by the shorter routes to Bukakata or Kagera Ports.

234. For these reasons I conclude that it is not worthwhile to test the economics of the projected railway by road transport until the railway is extended as far as Mubende. Accordingly arrangements should be made for a re-examination of the economics of the rail extension from Kampala to Mubende. If it is shown that the extension is likely to show profits within ten years, the work should be put in hand as soon as convenient. This will take some time to complete, and meanwhile the continuations to Mbarara and to Kilembe, or the provision of heavy road transport between Mubende and these places, can be considered in the light of circumstances then obtaining.

235. A *northward extension* of the railway from Soroti to Nimule through Teso, Lango and Acholi districts, would be about 170 miles, and on present costs would involve expenditure of more than £2,000,000. It would certainly allow much development of the country near which it would pass, but capital investment of this amount is probably not justified on Uganda's behalf alone. There

* An alternative route *via* Mubende might prove to be better, and is shown in Figure 8.



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Shaded areas are less than 30 miles from rail or port, existing in blue, proposed in red.

FIGURE 8 WATER AND RAIL COMMUNICATIONS AND PROPOSED NEW ROADS

This sketch map has been prepared prior to decisions on the debatable questions of extending railways and constructing new roads. Only a few of the existing roads are shown.

are, however, several extraneous factors involved; one is the possibility of a trans-African route crossing the Nile at or near Nimule, and connecting with the Congo system; another is the possibility of continuing the extension to Juba in the southern Sudan to provide a direct connection with water transport northward; a third is the Egyptian project for constructing a Nile dam at, or near Nimule, the cost of which would be greatly reduced if a railway reached to that point. Thus the northward rail extension depends mainly on decisions which are beyond the scope of Uganda, and the project must remain in abeyance until those decisions are taken. If the northward extension is constructed as a result of interests other than those of Uganda, it should, if possible, be aligned in such a way as to serve Uganda as well. For example, a small deviation of the direct route from the present Soroti terminus to Nimule would pass through Lira and Gulu where the trading interests of Lango and Acholi Districts are centred.

(c) *Roads*

236. Uganda's gravel roads have a justifiably good reputation, but a gravel surface cannot be expected to give the same smooth riding under the high loads and high speeds which are now demanded, as they did when traffic was lighter and slower. Consequently bitumen surfacing must be introduced where traffic is relatively heavy and a smooth surface is required under all weather conditions. Considerable expenditure is now required on improvements to existing roads, and on building new roads of which routes are indicated in Figure 8.

237. The existing road system has developed in two ways. The Public Works Department is responsible for the network of main roads, but most secondary roads, comprising in all a much greater mileage than the main roads, have been constructed and are maintained by the Native Administrations, with some grant aid from the Public Works Department. The new road programme is best considered therefore, under the two sub-headings of Public Works Department roads and Native Administration roads.

Public Works Department roads.

238. *General improvements*—Extensive work is required to bring the main roads up to standards needed for increasing traffic. Re-aligning of roads is extremely expensive, costing at least £1,000 per mile. Bitumen surfacing costs about £750 per mile and is expected to increase the cost of maintenance to more than twice as much as that of gravel surfacing—£66 per mile per annum compared with £30*. These factors need balancing against each other in deciding how many main roads should be surfaced with bitumen and how much re-aligning is desirable. Adopting the principle that slow cheap traffic will be the main need during the next ten years, it appears more desirable to surface with bitumen a large mileage of roads on their present alignment, slightly improved by evening out serious bends and corners, than to devote money and effort to drastic alterations of which the chief advantage will be speed. The result will be all-weather roads carrying motor cars at average speeds of 40 to 50 miles per hour and lorries at 30 to 35 miles per hour. The Entebbe-Kampala road is exceptional in that it requires extensive re-alignment because of its vital function in administration and as the link between the commercial capital and the main aerodrome.

239. With these factors in mind the Director of Public Works has prepared a programme for improvements. It is based on the assumption that both the number of vehicles and their axle loads are likely to double on main routes within 100 miles of Kampala. On sections where traffic density is expected to exceed 70 vehicles per day, some re-aligning, widening and full width bitumen surfacing are proposed. On all other sections improvements are scheduled in readiness for bitumen surfacing when it becomes warranted by traffic density. The roads to be surfaced with bitumen as soon as possible include those from Kampala to Entebbe (20 miles), Jinja to Iganga (16 miles), Kampala to Jinja (50 miles), Kampala to Masaka (80 miles), Kampala to Bombo

* The Kenya Development report gives a figure of £80 per mile per annum as the increased cost of maintaining bitumen roads compared with gravel.

(22 miles), Kampala to Mubende (90 miles)*. The work is to be undertaken in the above order and the total mileage amounts to 278, and the estimated cost to £355,500. The possibility that the railway may be extended from Kampala to Mubende should be taken into account because, in the existence of a railway, the road from Kampala to Mubende would carry much less heavy traffic and therefore some other road might take priority.

240. It has been calculated that the cost of motor transport, chiefly in petrol consumption, is about ten cents per ton mile less on a bitumen surfaced road than on a gravel road. Therefore, as bitumen surfacing gradually takes place throughout the main road system, consideration might be given to increased taxation on motor transport in order to produce additional revenue to repay the increased cost of maintenance.

241. In addition to the above road schedule the plan provides for general improvements to about 1,500 miles of other main roads. It will include widening and reducing dangerous corners, strengthening or replacing bridges, and consolidating or re-siting causeways. This is estimated to cost about £263,500.

242. A third part of the programme is to re-site maintenance camps on main roads by replacing the camps now situated about five miles apart by larger depots at 50-mile intervals, from which labour will be carried daily to their work by lorry. Each depot will provide accommodation for an itinerant inspector, an overseer, four family dwellings for regular employees, dormitories for temporary labour, a canteen and other amenities. Each camp is expected to cost about £3,000 and there will be some thirty in all.

243. The programme of road improvements is expected to take about six years to complete and is included *in toto* in this development plan. In addition there are certain new roads proposed which will be the responsibility of the Public Works Department.

244 *Ndaiga Road.*—The new port proposed at Ndaiga Bay at the southern end of Lake Albert depends on road facilities being provided to carry produce within a 30-mile radius. The most important area is around Fort Portal and therefore a road will be required between that town and Ndaiga Bay. This project was first discussed in 1936, and has been reconsidered recently as a possible route for carrying copper from Kilembe to the Kenya and Uganda Railways and Harbours transport. So many handlings would be required between Ndaiga and Mombasa that this is not worth serious consideration, but I am of opinion that the Ndaiga road would be a good investment for other reasons. The alignment has been surveyed and involves 23 miles of new road, of which five miles are down an escarpment, and a bridge with a 50-ft. span is needed. The estimated cost, including improvements to some 20 miles of existing road running north-east from Fort Portal, is about £30,000. This Ndaiga road would have a number of advantages: it would reduce by many miles the road-haul from the productive Toro country to the Kenya and Uganda Railways and Harbours' transport system; some of this produce, which ultimately travels north to the Sudan, would be able to proceed direct by water from Ndaiga to Nimule instead of taking a much longer route overland; trade between Toro District and the Congo would be facilitated; the connection from Ndaiga Port to Toro and other parts of Uganda would allow the fishery in the southern part of Lake Albert, one of the richest fishing grounds in Uganda, to be developed; the passenger route from the east coast to the Kilomoto area of the Congo, which is entered by way of Kisenyi Port on Lake Albert, would be shortened by several days, because the laborious route via Lake Kyoga, Masindi and Butiaba would be replaced by a road link from rail-head at Kampala (or Mubende when the railway is extended) to Ndaiga, and then a few hours' lake crossing to Kisenyi. If these advantages are assessed in terms of annual value, they must certainly represent an adequate return on the capital expenditure proposed.

245. *Other roads to Ndaiga.*—When Ndaiga Port is established with the new road from Fort Portal down the escarpment, the produce route from Bwamba area to the Kenya and Uganda Railways and Harbours transport could be reduced in mileage by constructing a new road of about

* Distances given are estimated mileages, after realignment.

20 miles from the foot of the escarpment on the Bwamba road eastward to Ndaiga. Further, it may be desirable at a later stage to tap the country east of Ndaiga by another road down the escarpment from the Hoima—Fort Portal road. This last-mentioned route would pass through the Nkusi river area which may be suitable for a special development scheme (see para. 351). The two possible roads to Ndaiga mentioned in this paragraph are not included in the financial provisions, but they are mentioned to indicate that Ndaiga may become the focal point of a large area of country which has high potential productivity.

246. *Kazinga Channel Causeway.*—Improvement to the main road link by ferry across the Kazinga Channel at Katunguru is required in the interests of general development, and may have special importance in relation to the exploitation of Kilembe copper until railway facilities exist. The floor of the channel is stiff clay and the depth only six to ten feet, so that a causeway could be built without great difficulty. The result would be that heavier traffic could be carried, delays would be avoided, and the cost of operating the two ferry-boats would disappear. If the Kazinga Channel is bridged in this way, a gap should be left for water transport between Lake George and Lake Edward. The causeway would have another advantage in that the flow of water in the channel would be concentrated through the gap, where it could be measured much more easily than at present, and controlled if and when that should prove desirable. The average flow might prove to be sufficient to provide water power, and in such cases the causeway might later be converted into a dam across the channel, thereby turning Lake George into a reservoir and increasing its size to allow a larger fishery.

247. *Motor ferries.*—The ferries of Uganda involve long delays on a number of main roads because they depend on manual effort with paddle or punt-pole, sometimes against the current. Therefore, it is proposed that three main ferries, at Terinyi across the Mpologoma swamp on the mai.. road from Jinja to Mbale and Soroti, at Atura across the Victoria Nile on the road from Masindi to Gulu, and at Laropi on the road from Arua *via* Moyo to Gulu, should be replaced by motor ferries. An additional motor ferry should be provided at Pakwach for the new route proposed n para. 253 from Gulu to Arua.

248. The above is an outline of the programme for Public Works Department roads which are included in the development plan. There are suggestions for two other important road links which might be added if the financial situation allows. One is a new main road from Kampala o Gulu, the other is a new main road from the Kilembe area to Mbarara. Both of these would horten by many miles the existing routes. If it is decided to construct them, the programme for mprovements mentioned above might be altered in minor respects.

249. *Kampala to Gulu.*—At present the main road runs through Kampala to Hoima and then urns eastward at more than a right angle through Masindi to Atura ferry before running north to Gulu, a total distance of about 270 miles. This distance could be greatly reduced, and at the same ime a new area of valuable country could be opened up, if the route were changed by building a oad further to the east. There are two possibilities both using the existing route from Kampala Bombo, and both involving a bridge over the Kafu river near Kibangya from which a road xists to Masindi. One possible route from Bombo would be north-west through Kiwoko and hence over country where communications are at present very poor; the other would follow the xisting route through Nakasongola. Either of these routes would reduce the journey from ampala to Masindi by more than 30 miles and would provide improved connections in Mengo istrict to the Kenya and Uganda Railways and Harbours transport, southward to rail-head at ampala and northward to Masindi Port. From the suggested bridge over the Kafu River near ibangya, a new road northward for some 12 miles to Masindi Port would connect with the xisting Gulu road. Thereby the whole journey from Kampala to Gulu would be reduced by about miles.

250. *Kilembe to Mbarara.*—In order to aid development of the Kilembe copper deposits until is possible to extend the railway to that area, and to ease communications between a possible

new Provincial headquarters and the districts which it will control (see para. 204), the question of building a main road from Kilembe to Mbarara east of Lake George might be considered. Part of this route, from Mbarara as far north as Kanyambalala, is already in being as a Native Administration road. Beyond this there is a distance of about 35 miles, first northwards across the River Mpanga below its confluence with the River Katonga in the region of the escarpment, and then swinging westwards around the swamps near Lake George. The distance from Kilembe to Mbarara by this route would be about 110 miles compared with 140 miles, including crossing the Kazinga Channel, by the existing main road. An added advantage of the route east of Lake George is that it would pass through the area of the Mpanga river which may be suitable for a special development scheme.

251. *Tororo—Bugiri.*—If the project materialises for building a new "north road" from Kenya to link with the Uganda system at Tororo, interterritorial transport is likely to enter Uganda at Tororo instead of by the present main road at Busia. In such case, it will probably be desirable to construct a new link from Tororo to Bugiri. This would involve about 25 miles of new road and would save 15 miles on the route from Tororo to Jinja.

Native Administration roads.

252. The following roads, which have importance primarily for inter-district communication, are proposed for construction to standards considerably lower than Public Works Department roads. The cost of building Native Administration roads varies from district to district. Sometimes it is less than £100 per mile, but it is averaged for purposes of this plan at £150 per mile in order to have a margin. It is important that the Native Administrations should take advice on alignment of new roads from the Public Works Department which will be able to second trained men for the purpose a few years hence. This will sometimes involve adopting a more expensive route and installing more expensive bridges, which will enhance the value of the roads and reduce their future maintenance costs.

253. *Gulu to Pakwach.*—This connection is required for inter-district communication in the new Northern Province. It would not carry much produce but would be extensively used by traders and for administrative purposes. In the event of development of the River Aswa catchment area (see para. 346), it would have enhanced importance: running along the watershed forming the southern boundary of the Aswa basin, it would form the boundary between the developed area to the north and the game reserve to the south. The road is already constructed by the Acholi Native Administration from Gulu to Anaka. Thence the distance to Pakwach is about 35 miles, and is fairly easy country according to a recent examination by the Game Ranger. The economics of the road have not been worked out in detail, but capital investment would almost certainly be justified by the saving of mileage and time of Government officers and traders when travelling to Arua, and the southern part of West Nile District, and by easing administration of the province and supervision of the sleeping sickness area east of the Albert Nile.

254. *Masindi to Pakwach.*—When the road from Gulu to Pakwach is complete it will be desirable to connect it southward to the Bunyoro system near Masindi by a route, which is not yet surveyed, through the game reserve and crossing the Nile at or near the Murchison Falls. This road will be useful for inter-district communication, and will also have a high tourist attraction. The construction should be postponed for some years pending a decision on the new Public Works Department main road from Kampala and Gulu (see para. 249). If the latter is undertaken, a road from Masindi to Pakwach may be unnecessary or its alignment might be different.

255. *Gulu to Moroto.*—The present route is possible only in dry seasons and is devious. A much improved road is needed for purposes of Provincial Administration and prospective developments in Karamoja District (see para. 362).

256. *Road round Mount Elgon.*—A road from Mbale is already constructed for a distance of about 50 miles to Nyengyi river. Beyond this point a connection is proposed around the north side of the mountain to the Kenya road system at the River Suam, the new road connecting with

others at Greek River on the way. The distance would be about 50 miles through difficult country. The completion of this route is required for several reasons; firstly to overcome administrative difficulties on the north side of Elgon where the peace is so often disturbed by cattle raids; secondly, to assist the development of southern Karamoja, and thirdly to open up for tourist traffic one of the most attractive parts of East Africa which includes game country and trout streams. The road will benefit Kenya as well as Uganda, and therefore might qualify for part payment from the regional Colonial Development and Welfare vote.

257. *Ruhinda to Lake Edward.*—Ruhinda is the most northern gombolola in Kigezi District, close to the area in which new settlement is being organised to relieve the population pressure around Kabale. It is proposed that a new road about 25 miles long, should be constructed northwards from Ruhinda to a small fishing village on the shore of Lake Edward which is not shown on any map. The new road would have a number of advantages in assisting settlement schemes and in providing a shorter route for the transport of produce from other parts of the Kigezi District. For example, if the railway is extended to Kilembe area, barge transport could be provided from the fishing village on Lake Edward to the crossing of the Kazinga Channel at Katunguru. Produce would then be evacuated northwards and the present long lorry haul from the north of Kigezi District to Kagera Port would be reduced to less than one half. This is looking some time ahead but meanwhile the new road is justified because it would enable fish to be carried from Lake Edward into the heart of Kigezi District where it is much required; it would provide attraction to the settlement area which skirts the Lake Edward plains; and the undulating country between the plains and the escarpment, through which the road would pass, would be made accessible for tsetse clearance and further settlement.

258. *Road research.*—Investigation on local road materials has been started by the Public Works Department which can now assess with some confidence the behaviour of local materials, but there is as yet no interterritorial organisation for investigating new types of road surfacing and methods of construction. Reliance has been placed up to date on the Road Research Board of the Department of Scientific and Industrial Research in Great Britain. In view of the developments which are now envisaged throughout East Africa it seems desirable for investigations to be undertaken, preferably on an interterritorial basis. A small research station or a mobile investigational team might, perhaps, be arranged with assistance from the Road Research Board.

259. Table 14 includes only those works which are definitely recommended as being within the scope of the plan. It makes no provision for certain other new roads which are discussed above. This paragraph explains the entries in the table:—

A. *Contributions to research.*—£500 in column 4, rising to £1,000 in column 8, is a provisional allocation for the project mentioned in the last paragraph.

B. *Normal expenditure.*—The total recurrent charge for road maintenance was £117,600 in 1946, of which £55,600 was in respect of grants to Native Administrations for road maintenance. This figure was some thousands of pounds below what it should have been had the Public Works Department been in a position to carry out all the maintenance necessary. Accordingly provision is made of £15,000 in column 3, rising to £20,000 in column 7, as normal expansion.

C. *General improvements and bitumen surfacing.*—The programme of general improvement and bitumen surfacing is shown as a non-recurrent expenditure of £709,000 in column 5, made up from bitumen surfacing—£355,500, improvements on other routes—£263,500, and maintenance depôts—£90,000. No provision is made in column 4 for the maintenance of these works for the following reason: bitumen surfacing is expected to reduce maintenance for the first four to six years, but the saving during these initial years will be absorbed later when new coatings of bitumen are required. During 1947-1956, these two effects on maintenance costs are expected to equate. By 1957, however, assuming that upwards of 300 miles are surfaced with bitumen, there will be increased maintenance costs of about £7,500 residual from the improvements programme, so this figure is shown in column 8.

D. *Ndaiga Road.*—£30,000 in column 5 is the estimate for construction, and £700 in column 8 is for annual maintenance when complete. On the assumption that this road will be built within two or three years, £500 is shown in column 4.

E. *Kazinga Channel causeway.*—£20,000 in column 5 is a rough estimate for this project.

F. *Motor ferries.*—£12,000 in column 5 will probably be sufficient to provide four motor ferries. Nothing is included in column 4 for maintenance because this should be within the figure at present spent on paying paddlers at the four ferries named, and at the ferry across the Kazinga Channel.

G. *Native Administration roads.*—Entries in column 5 are estimates at £150 per mile. £3,000 in column 4, rising to £3,500 in column 8, is for maintenance after construction. All these amounts would be expended in the form of road construction grants to Native Administrations.

TABLE 14.—ROADS

Subject	*1946 Recurrent*	*Normal Expansion 1947–1956* Average annual recurrent additional to 1946	*Development Schemes 1947–1956* Average annual recurrent during 10 years	*Development Schemes 1947–1956* Non-recurrent in 10 years	*Total 1947–1956* Normal expansion plus development schemes [cols. 3 (×10)+4 (×10)+5]	*Forecast for 1957 Annual Recurrent Expenditure* Residual from normal expansion	*Forecast for 1957 Annual Recurrent Expenditure* Residual from development schemes	*Forecast for 1957 Annual Recurrent Expenditure* Total recurrent [columns 2+7+8]	*1957 Anticipated Revenue from Development Schemes*
1	2	3	4	5	6	7	8	9	10
	£	£	£	£	£	£	£	£	£
A. Contribution to research	..	..	500	..	5,000	..	1,000	1,000	
B. Normal expenditure	117,600	15,000	..	..	150,000	20,000	..	137,600	
C. General improvements and bitumen surfacing	..	..	..	709,000	709,000	..	7,500	7,500	
D Ndaiga road	..	..	500	30,000	35,000	..	700	700	
E. Kazinga Channel causeway	..	..	..	20,000	20,000				
F. Motor ferries: Terinyi, Laropi, Atura, Pakwach	..	..	..	12,000	12,000				
G. Gulu–Pakwach (75 miles approx.)		..		11,000					
Masindi–Pakwach (70 miles approx.)	..	..		10,000					
Gulu–Moroto (100 miles approx.)	..	..	3,000	15,000	78,000	..	3,500	3,500	
Elgon road (50 miles approx.)	..	..		8,000					
Ruhinda to Lake Edward (25 miles approx.)	..	..		4,000					
TOTALS	117,600	15,000	4,000	819,000	1,009,000	20,000	12,700	150,300	

(*d*) *Air*

260. The future of civil aviation in Africa is extremely difficult to predict, because aircraft types and their requirements for landing and taking-off are liable to change with startling rapidity. Consequently, a runway constructed this year at great expense may be too small or unnecessarily large for aircraft which will require to use it five or ten years hence. Indications are that, when the present service of flying-boats comes to an end, the main aerodromes for long distance aircraft serving the East African region will be outside Uganda. Therefore provisions for large aircraft in Uganda itself are likely to be used only in emergencies or for occasional landings. Uganda aerodromes will therefore be required primarily for short distance feeder air-services, and for the Protectorate's own internal communications. Both of these objects are likely to be achieved by relatively small aircraft requiring short landing grounds.

261. The scheme for Uganda includes an aerodrome at Entebbe, suitable for medium aircraft. This is now nearing completion but may not be entirely satisfactory for future requirements and therefore may involve further capital expenditure. The rest of the scheme provides for landing grounds for light aircraft at Masindi, Arua, Soroti, Tororo, Moroto and Gulu, where in most cases rough landing grounds exist but need considerable expenditure to bring them up to even modest standards. Small landing grounds may also be required at one or two other places, and at Jinja it is possible something considerably better may be required owing to its importance as a commercial centre and as the headquarters of the military forces stationed in Uganda.

262. In view of the uncertainty of future requirements large expenditure in the immediate future is not considered desirable, but it will certainly be needed in the course of the next ten years. Provision is made accordingly in Table 1. The 1946 recurrent cost of maintaining present facilities (£13,700 in column 2) includes £6,000 as contribution to the Empire air-mail scheme, and £4,600 as upkeep of aerodromes and marine equipment for flying-boat ports. This is estimated to increase by £1,000 in column 3, rising to £2,000 in column 7. The average recurrent cost of maintaining new facilities is entered at £3,000 in column 4, rising to £4,000 in column 8. New non-recurrent expenditure on landing grounds is entered provisionally at £200,000 in column 5, which includes £50,000 already approved from the Colonial Development and Welfare Uganda vote. This amount was approved on the understanding that an equal amount would be provided from other funds: thus the Entebbe aerodrome is now expected to cost about £64,000 of which £32,000 will come from Colonial Development and Welfare vote. Revenue from landing fees at the end of the 10-year period is entered at £1,000 in column 10.

5. Posts and Telecommunications

263. Posts and Telecommunications have been organised in East Africa on an interterritorial basis since 1933. Each territory contributes capital and recurrent cost in proportion to the services rendered and receives revenue from the interterritorial department. Proposals have been made for making the interterritorial department self-financing, organised on lines similar to those of the Kenya and Uganda Railways and Harbours. When this is brought about it will no longer be incumbent upon Uganda to provide the necessary capital and recurrent cost, nor will as much revenue be received as on the present arrangement, but it is understood that the net effect on Uganda's finances will be a slight improvement. For the time being the plan for the development of these services is prepared as though the present arrangement was continuing for the next 10 years, although it is desirable that the change should not be delayed so long. It could be made at any time within that period without any dislocation of services.

264. Claims of different departments of Government and of the public have to be balanced against each other in deciding what proportion of available funds should be devoted to posts, telegraphs, telephones and wireless telegraphy. Doctors, for example, are anxious for an extended telephone service so that headquarters can contact hospitals and dispensaries without delay. The Administration would probably prefer more telegraph lines and post offices because they cannot always rely on the spoken word in their dealings with Native Administrations. The urban public might prefer a concentration on telephones and telegraphs, but the rural public would certainly prefer more postal facilities together with an extension of Savings Banks because they are markedly absent within reasonable reach of the great majority of villages and trading centres In outlying districts where telegraph and telephone lines are costly to build and difficult to maintain, wireless telegraphy has obvious advantages, but there are limitations to the extent to which wireless can be employed owing to congestion of the frequency spectrum.

265. Some attempt is made to cover all these requirements in the financial plan summarised in Table 15. It is somewhat weighted on telephones because capital expenditure on telephones is fully justified by the revenue earned. Moreover, the demand has been demonstrated: the waiting list for telephones in Uganda is equivalent to all the work on installations accomplished during the past six years, and to this must be added additional demand which is unexpressed because it was known that the work could not be undertaken.

266. This paragraph explains the entries in Table 15.

A. *Normal Expenditure.*—Some expansion of expenditure will be necessary to maintain the existing services which are shown as £88,300 in column 2. £1,000 is therefore inserted in column 3, rising to £1,700 in column 7.

B. *Telecommunications:*

(i) *Buildings.*—£90,000 in column 5 provides for the construction and extension of buildings required for existing facilities (£70,000), and buildings where facilities do not yet exist (£20,000).

(ii) *Telephone Exchanges.*—£66,000 in column 5 is for expansion and improvements to existing public exchanges (£55,000), and for the provision and extension of rural exchanges (£11,000).

(iii) *Telephone trunk network.*—£46,000 in column 5 is for the extension and improvement of both main and subsidiary networks.

(iv) *Telegraph network.*—£11,000 in column 5 is for the extension and improvement of the general network.

(v) *Underground trunk between Kampala and Entebbe.*—In East Africa, underground trunk cables have not hitherto been economically justifiable, but if the centre of Government remains at Entebbe for some time to come (see para. 201) the telephone communications with Kampala must be greatly improved and made impervious to weather. Accordingly, provisional entries are made pending more detailed inquiry as to costs. The capital cost of the work would be about £19,000, but savings would be effected by the value of the existing overhead asset which could be re-used (£1,400), and savings in additional overhead facilities included above under B (iii) (£3,300), so the entry in column 5 is £14,000. Some £300 per annum

would be saved in recurrent charges for upkeep and this amount has been deducted from entries against B (i) to (iv) in columns 4, 8 and 9. Additional revenue is estimated at £500 (column 10). Thus it appears that this provision is financially desirable.

(vi) Since it will be impossible to undertake a programme of this magnitude ((i) to (v) above) with staff sanctioned at present under annual estimates, the above figures cover all charges appropriate to the execution of the works. This assumes the engagement of special staff on short-term contracts, probably by secondment from the British Post Office, and charging their salaries to non-recurrent expenditure. It is hoped to complete the whole programme in the course of 6 years, 1947–52, and it is desirable that the building programme should be undertaken first since it will facilitate the remainder. The increased recurrent expenditure from this programme will amount to about £15,000 (column 4) with a residual recurrent in 1957 of £21,800 (column 8). Resulting from the expanded service the annual revenue is estimated to increase by £28,000 per annum (column 10).

C. *Wireless Telegraphy.*—It is suggested that the number of additional wireless stations should be increased by about 10 during the next 10 years. Entries in columns 4, 5 and 8 assume that each installation, including a small building, will cost £500 and that each will have an operator at £5 per month.

D. *Rural Post Offices.*—Post offices in small towns and villages should be designed primarily to serve the needs of the African and Indian population, and need not involve pretentious buildings. In most cases they should be arranged as postal agencies on the lines of village post offices in Great Britain so that little capital expenditure would be involved. On this assumption, entries are made of £3,500 in column 4, rising to £4,600 in column 8, with the idea of adding a number of such post offices each year up to 100 at the end of the 10-year period. The entries include the remuneration of agents, and £1,000 per annum for inspection, equipment and consumable stores.

TABLE 15—POSTS AND TELECOMMUNICATIONS

Subject	*1946* *Recurrent*	*Normal Expansion 1947–1956*	*Development Schemes 1947–1956*		*Total 1947–1956*	*Forecast for 1957 Annual Recurrent Expenditure*			*1957 Anticipated Revenue from Development Schemes*
		Average annual recurrent additional to 1946	Average annual recurrent during 10 years	Non-recurrent total in 10 years	Normal expansion plus development schemes [cols. 3 (×10) + 4 (×10) + 5]	Residual from normal expansion	Residual from development schemes	Total recurrent [columns 2+7+8]	
1	2	3	4	5	6	7	8	9	10
A. Normal Expenditure	£ 88,300	£ 1,000	£ ..	£ ..	£ 10,000	£ 2,000	£ ..	£ 90,300	£
B. Telecommunications									
(i) Buildings	..	..		90,000					
(ii) Telephone exchanges	..	..		66,000					
(iii) Telephone trunk network	..	..	15,000		363,000	..	21,800	21,800	28,000
(iv) Telegraph network	..	..		46,000					
(v) Underground trunk, Entebbe to Kampala	..	..		11,000					
	..	..	..	14,000	14,000	..	..	..	500
C. Wireless Telegraphy	..	..	400	5,000	9,000	..	600	600	
D. Rural Post Offices	..	..	3,500	..	35,000	..	4,600	4,600	
TOTALS	88,300	1,000	18,900	232,000	431,000	2,000	27 000	117 300	28 500

6. Hydro-Electric Power and Nile Control

267. This matter is under consideration and it is premature to give more than an outline of the possibilities. No reference can be made to the financial implications until the subject has been examined more thoroughly, and therefore no provision is made in Table 1. If it is decided to proceed with a big scheme, it may be necessary to raise a substantial loan for the purpose.

268. There are two main potential sources of hydro-electric power in Uganda: one is the series of falls and rapids immediately below the origin of the Nile from Lake Victoria close to Jinja; the other is the Murchison Falls on the Victoria Nile, some 20 miles up-stream from Lake Albert. There are other minor potential sources, notably the falls and rapids on the Mobuku River which rises near the summit of Mount Ruwenzori and flows eastwards past Kilembe to Lake George. For the next ten years at least the limit to which it will be economic to transmit electric power in Uganda is unlikely to exceed 100 miles. Circles with radii of this length, centred on the three sources named, conveniently cover the whole Protectorate with the exception of a small area around Masaka and the north-east including Karamoja and parts of Acholi and Teso Districts.

269. The source of power near Jinja is the only one considered here because it is likely to be the first to be developed on account of the considerable potential consumption within 100 miles. The area includes Jinja, Kampala and Entebbe towns, two sugar factories, a large number of cotton ginneries, the phosphate workings near Tororo, gold mines near Busia and the area in South Busoga selected for a first pilot development scheme. The economics of hydro-electric power near Jinja may also be affected greatly by large consuming centres in Kenya.

270. Power, however produced, represents a small fraction of production costs in any industry, but the replacement of wood by electricity as a source of power over this considerable part of Uganda, would probably be followed by many developments which are difficult to foresee. Experience with electricity in other parts of the world has nearly always shown that the most optimistic estimates of consumption have been greatly exceeded soon after the provision of a reliable and cheap supply.

271. The possibilities near Jinja were examined by the Hydro-Electric Commission of 1935 which set out four possible schemes. Two of these were of small size, one at the Ripon Falls and the other at Bujagali Rapids a few miles downstream, would be capable of a maximum output of about 4,000 kw. each. The two other schemes suggested were large. One would involve building a dam close to the road and rail bridge at Jinja; it would give a head of water of about 38 feet, and would be capable of 50,000 kw. output. The other would involve a dam across the Owen Falls, giving a head of 60 feet, and potential output of 75,000 kw.

272. Both the major schemes would involve flooding the Ripon Falls and thereby the dams would be capable of controlling the level of Lake Victoria. This introduces the possibility of a number of advantages which are additional to the provision of cheap electric power. The most important are described below:—

A. Water transport.—This affects both Lake Victoria and Lake Kyoga. At present the range of level of Lake Victoria is 1·64 metres, and at times of low level difficulties are met at lake ports. Similar difficulties are met with at the ports on Lake Kyoga where the water level under the natural regime is lowest at the time of year when the cotton crop from the surrounding districts is ready for transport. If the discharge of the Victoria Nile at Jinja were controlled there would be opportunity for overcoming these difficulties by controlling the level of the lakes.

B. Rice cultivation.—The same control of discharge and lake level might give large opportunities for rice cultivation around the shores of Lake Kyoga which experiments have already shown to be suitable.

C. Public Works.—Many works are undertaken around the shores of Lake Victoria chiefly for anti-malarial purposes at townships. They are difficult to plan and expensive to carry out and maintain because variations of water level cannot be forecast. If the lake level were subject to control the work might be eased.

D. Mbwa fly.—At present this fly (*Simulium damnosum*) renders unproductive about 1,000 square miles of country north of Jinja. The larvæ can live only in rapid water and are killed by desiccation. If the discharge from Lake Victoria were under control it might be greatly reduced for brief periods, leaving a minimum flow required for electric generation. Most of the rapids would then be dried out and it is possible that the fly might thus be controlled, or that the reduction of flow would render practicable the use of insecticides.

E. Manufacture of fertilisers.—Among other industrial activities, the large amount of electric power at Jinja might be used for manufacturing nitrate fertilisers by the fixation of atmospheric nitrogen according to the process which is now being adopted in many parts of the world. At present this is merely in the realms of possibility, but the fact mentioned in para. 94 that the fertilising effect of Tororo phosphate is greatly enhanced by the addition of nitrate fertilisers suggests that the possibility of nitrate manufacture in Uganda is worth full enquiry. It is estimated that the electric power required to fix one ton of atmospheric nitrogen, equivalent to five tons of sulphate of ammonia, is 17,000 kilowatt hours.

273. These reasons suggest that it may be greatly to the advantage of Uganda, and perhaps to other East African territories, to instal a large scheme for hydro-electric power near Jinja rather than a small scheme which might be adequate only to meet the demand immediately foreseeable. A large scheme, involving control of the level of Lake Victoria and hence of Lake Kyoga, would cost several million pounds, and capital investment of this order would probably be uneconomic for the purposes of East Africa alone. It so happens, however, that the control of Lake Victoria and of the discharge down the Victoria Nile may be of great value to Egypt, and perhaps to the Sudan, which depend for their prosperity on the controlled flow of the river Nile.

274. The needs of Egypt involve "annual storage" to deliver water in Egypt at the times of year when it is required for agriculture, and what has been called "century storage" to guard against a series of years of unusually low or high precipitation when the danger exists either of insufficient water or of dangerous floods. For both purposes a series of large works on the Nile has been proposed. As affecting Uganda, proposals made up to now are confined to Lake Albert and the Albert Nile between the lake and Nimule. The project to establish a large dam in this region would inundate a considerable area of country and would therefore lead to many difficulties. If, however, part of the water required was stored in Lake Victoria, the size of the Lake Albert reservoir and the cost of constructing a dam there would be reduced. Thereby both the difficulties to be overcome by Uganda and the cost to Egypt would be less.

275. It is concluded that a joint scheme to control the level of Lake Victoria and the discharge down the Victoria Nile would be to the advantage of both East Africa and Egypt. Expert examination of this major project is now proceeding and the question of hydro-electric power should await its results.

7. Urban Development

276. There is a large and growing need for planned development of urban areas, not only in Kampala and Jinja, but also in towns which are growing round Provincial and District headquarters. The general layout needs revision in some cases; and heavy expenditure must be incurred in some towns on services such as water supply, sewerage, drainage and perhaps electricity.

277. This paragraph explains the entries in Table 1.—£55,100 in column 2 is at present expended mainly on contributions to township authorities for the maintenance of works which are not revenue-earning. Provision is made for an increase in the expense of existing services by an entry of £5,000 in column 3, rising to £7,000 in column 7. £50,000 in column 4, rising to £60,000 in column 8, is an additional allocation for the maintenance of new works, and will also be expended in grants to township authorities, or to municipalities when they are set up. £1,500,000 in column 5 is a provisional block entry for the capital cost of the new services in urban areas for which maintenance is provided in column 4. Of the total amount it may be expected that about £1,000,000 will be required for sewerage, roads and other services and about £500,000 for water supplies. Revenue from the expenditure on water supplies is assumed after ten years at the rate of 3% so £15,000 is entered in column 10. These proposed allocations are intended to cover initial town planning surveys and expenditure would not necessarily be confined to existing urban areas.

8. Housing Government Staff

278. Provision is made under subject headings for all new houses required for European staff averaged over the 10-year period at £2,500 each. Upwards of 200 in all will be required. Various development measures, for example, pilot schemes, will require houses for a relatively short term of years, so that the capital expense of permanent houses would be partly wasted. For such purposes sectional or removable houses might be suitable. Big advances in this type of construction have been made in recent years, but there may be need for investigation on types suitable for African conditions. In deciding the number of houses which will actually need to be constructed, regard must be paid to the factor of overseas leave since a proportion of the staff will always be absent from the territory. Any saving which might thus be made, however, may be more than offset by the necessity to overtake outstanding needs for the housing of existing staff.

279. There is no provision under subject headings for housing members of the Local Civil Service, that is, Asian and African Government staff other than those recruited from overseas, because the policy has been laid down that the Local Civil Service will themselves be responsible for finding their accommodation, or will pay for accommodation when provided by Government. This principle by no means solves the problem, because in most parts of the country housing is inadequate or non-existent. It is proposed, therefore, that where Asian and African houses are required for local civil servants, Government should provide the money for building them. The houses would then either be sold outright or on hire-purchase terms or rented to the individuals who will occupy them. Normally the appropriate rent would be deducted from salaries according to a schedule already fixed. By these means the housing of the Local Civil Service would gradually be placed on an economic basis.

280. The cost of building is so high that in some cases it may be impossible to charge an economic rent, but this disparity should be capable of adjustment later. Meanwhile capital expenditure is required on a considerable scale, to build Government-owned houses in urban development schemes, and small groups of houses or isolated dwellings scattered through the country as required. Some of the building could presumably be undertaken by the Public Works Department; some would be put out to contract; and some could, perhaps, be undertaken by the Native

Administrations. In addition, grants should be made to those departments which may have facilities for building, *e.g.*, the Forest Department. If local civil servants are themselves able to arrange for the building, individual grants might be made after Government has approved the designs.

281. This scheme will require a fund of substantial size. Capital expenditure will be reimbursing and therefore will be suitable for financing from loans. In order to get some idea of the total fund required, the following calculation has been made. The number of officers in the Local Civil Service is at present 155 Asians and 1,016 Africans. It is assumed that one-third are already adequately housed, and that the number of Asians will remain about the same, while Africans will increase by one-third during ten years. Therefore, in round figures, about 100 Asian houses and 1,000 African houses will be required. Estimating the cost of building at £1,000 per Asian house and £400 per African house, it appears that a building fund of £500,000 will suffice, and this figure is accordingly entered in Table 1, column 5.

282. If payments out of this fund for Government-owned houses are to be self-reimbursing, an annual return of 4% would be required (3% on the loan and 1% on maintenance, see paras. 304 and 289). This may involve charging disproportionately high rents compared with the wages of occupants, so a 3% return is assumed and accordingly revenue after ten year is entered in column 10 at £15,000.

9. African Housing

283. The problem of housing the Local Civil Service, acute though it is, is small in relation to that of improving the standard of housing of the general population. This can be envisaged in two parts, urban and rural.

284. In towns, housing schemes are urgently needed, and while the aim must be to establish them on an economic basis, heavy subsidies will certainly be required. In the Kampala area, for example, slum conditions have already developed and may grow rapidly. Nowhere in the world has it been possible to institute slum clearance and healthy housing for the urban poor on an economic basis, and Uganda is not likely to prove an exception.

285. The problem of rural housing is far more complicated. Much study of a sociological kind as well as of constructional methods is needed before heavy expenditure is undertaken, because the type of housing must be related to the standard of living of the people and this varies greatly from district to district. The numerous and varied traditional methods of house construction from local materials have much to commend them, but certain improvements could no doubt be made to meet new requirements. There is special need, particularly in Buganda, for fire-proof roofs, and this might be met by providing roofing materials on a large scale if such material can be made cheaply.

286. It is not possible to assess the financial requirements during the next ten years for either urban or rural housing of Africans. Money will be required for slum clearance and urban housing schemes, where the return will certainly be uneconomic, and for experiments in rural areas. Accordingly a fund of £500,000 is proposed for the purpose, and this amount is entered in Table 1, column 5. Revenue from loans made from this fund is assumed at 1% per annum, so £5,000 is entered in column 10.

10. Government Buildings and their Maintenance

287. This development plan involves a large programme of public buildings, including offices, stores, schools, hospitals, institutions of many kinds, and houses. Allocations for the capital cost of these buildings are made under other headings throughout the report, and amount in all to about £2,870,000, of which about £480,000 is for housing European staff and such Asian staff as may be recruited overseas. This total excludes the building funds of £500,000 each proposed above for housing the Local Civil Service and for general African housing.

288. When preparing detailed plans for this large building programme simplicity of design should be a guiding principle, in order to reduce costs. Moreover, the high building standards which Uganda has tended to follow, cannot be maintained if the large building programme is to be executed with the funds available. The Public Works Department estimates roughly that the cost of building in Uganda is about equally divided between labour, local materials and imported materials and that building costs have risen from about Shs. 1/10 per cubic foot pre-war to Shs. 1/60 at present. In view of the large building programme, any methods which could be adopted to reduce the cost of local materials would effect a big saving in the total cost. There appear to be two possibilities of achieving this; one, that Government should itself undertake the production of bricks, tiles and timber for its own use; the other that tenders should be sought for large quantities for delivery over the next few years. A reduction of 10% on local materials would in total effect savings over £100,000 on the building programme.

289. The maintenance of existing Government buildings and house property has financial provision of £29,200 in column 2 of Table 1. Provision for maintenance is needed for the above total of £2,870,000, and this is best estimated provisionally at 1% per annum on the capital cost. On the assumption that the building programme will be spread evenly through the 10 year period, entries are made in Table 1 of £14,400 in column 4, rising to £28,700 in column 7. Houses for the Local Civil Service and general African housing are assumed to be maintained from the two funds proposed for these purposes.

11. Public Works Department—General*

290. Many of the Government buildings, roads and other public works included in this plan will be constructed by contract and will not, after the initial planning, require more than office work and supervision by the Public Works Department. Others will, however, be constructed by the department itself, of which the staff will require strengthening. The present establishment of permanent staff, when brought up to full strength, is considered to be sufficient for general supervision and all new maintenance. The extra staff required for construction will be employed, where possible, on short-term contracts. The efficiency of the general departmental activities should be greatly increased by a large central depôt, including a pool of materials and machinery, which is already being established in Kampala.

291. *Building research.*—Up to date there has been no organisation in East Africa for the investigation of building materials and methods of construction suitable for local conditions. In particular, much more study is required for types of African housing, and this involves sociological as well as engineering problems. Kinds of construction new to Uganda have in recent years been tried out with varying success, for example, murram blocks, pisé-de-terre, "cob" building, tile-making of various kinds, and also minor industries like making fibre-board from papyrus. A typical problem requiring investigation is how best to provide an impervious surface to the porous rock

* See Postscript, para 419.

and *stone when constructing aprons to collect rainwater. A group of scientists trained in building* research could help greatly in evolving methods of construction which are much cheaper than many now in use, and cheapness of building is a prime consideration in Uganda where the great bulk of the population have little or no money to spend.

292. For these reasons it is suggested that the advantages of establishing one or more building research units should be examined, preferably on an interterritorial basis. Such units might be set up in close liaison with the Department of Scientific and Industrial Research in England, a procedure which has been suggested also in connection with the investigation of road construction and water pollution. With this in view a provisional allocation is made in Table 16.

293. This paragraph explains the entries in Table 16.

A. *Contributions.*—£1,000 in column 4, rising to £1,500 in column 8, is included for recurrent contributions to building research to provide for the above project.

B. *Normal expenditure.*—£114,300 in column 2 includes salaries and other recurrent charges of the Public Works Department (approximately £92,800) together with such items from "Public Works Recurrent" as are not included under other headings (*i.e.*, roads, buildings, urban development). A sum of £20,000, which is shown in the 1946 estimates for Public Works Recurrent as unallocated stores, has been excluded since this is expected to be counterbalanced over a period of years by receipts from stores issued and charged against various works. £2,000 is entered for normal expansion in column 3, rising to £3,000 in column 7.

C. *Temporary staff.*—An amount of £200,000 entered in column 5 is for Government employees engaged on short term contracts to carry out development programmes.

D. *Central depôt.*—£125,000 in column 5 is for capital expenditure. No recurrent expenditure is included as it is assumed that recurrent costs of the depôt will be recoverable under charges for work done.

E. *Housing.*—£25,000 in column 5 is for ten European houses for permanent staff on establishment but not yet appointed and for some of the temporary staff.

TABLE 16.—PUBLIC WORKS DEPARTMENT GENERAL

Subject	*1946* Recurrent	*Normal Expansion 1947–1956* Average annual recurrent additional to 1946	*Development Schemes 1947–1956* Average annual recurrent during 10 years	*Development Schemes 1947–1956* Non-recurrent in 10 years	*Total 1947–1956* Normal expansion plus development schemes [cols. 3 (×10) + 4 (×10) + 5]	*Forecast for 1957 Annual Recurrent Expenditure* Residual from normal expansion	Residual from development schemes	Total recurrent [columns 2+7+8]	*1957 Anticipated Revenue from Development Schemes*
1	2	3	4	5	6	7	8	9	10
	£	£	£	£	£	£	£	£	£
A. Contributions to research			1,000		10,000		1,500	1,500	
B. Normal expenditure	114,300	2,000			20,000	3,000		117,300	
C. Temporary staff				200,000	200,000				
D. Central Depôt				125,000	125,000				
E. Housing				25,000	25,000				
TOTALS	114,300	2,000	1,000	350,000	380,000	3,000	1,500	118,800	

12. Printing

294. The demands on the Government Press have increased during the war years and future development will require a still greater output of work. During the next ten years the Press should be capable of handling at least three or four times the work to which it was accustomed pre-war.

295. In explanation of the entries in Table 1, £1,000 per annum in column 3, rising to £1,500 in column 7, provides for an expected increase in costs of present activities. £4,000 in column 4, rising to £6,000 in column 8, is for an increase of the European staff by four, with a balance for additional printing materials. An enlarged African staff is already provided for in the 1946 estimate in column 2. £60,000 non-recurrent expenditure in column 5 is made up of three items: £25,000 for new printing machinery which will be confined to letterpress printing, but adequate to meet a greatly increased demand; £27,500 for new office premises which will be required if the Press moves to Kampala, but which may be reduced to £20,000 as additions to the present offices if it remains at Entebbe; and £7,500 for three European houses.

13. Tourism, National Parks and Hotels

296. Uganda has unique opportunities for the tourist, so that development of this industry should take place during the next ten years. Facilities will be needed in the game reserves and other areas of special interest in order to increase their attractiveness to visitors. Rest camps and shelters at strategic points should be built, and also tracks or roads through some of the more attractive but less accessible areas, for example, to the shores of Lake George and possibly to the Murchison Falls.

297. The larger question of allocating certain areas as National Parks will need thorough examination before many years pass. Some of the areas now given over to wild nature will no doubt have to be reclaimed for human settlement and agricultural production, but others must certainly be earmarked permanently for recreational purposes, and in these it may be desirable to improve conditions for wild life as well as for visitors (see para. 128).

298. The creation of National Parks should be considered, not only in relation to some of the present game reserves, but also in other areas of unique scenic and scientific interest. The upper levels of Mount Ruwenzori provide an example where the provision of paths and camps, and possibly of a track to near the snow line, would help greatly in attracting visitors. Big improvements will be required in the hotel industry also if the possibilities of revenue from tourist traffic are to materialise. This presumably will be the task of private enterprise and, perhaps, of the Kenya and Uganda Railways and Harbours, but the urgent need for a hotel at Entebbe (see para. 202) might, perhaps, justify capital expenditure by Government.

299. For the above purposes a block allocation of £50,000 is entered in Table 1, column 5. Details of its expenditure will need working out by several departments of government in collaboration with unofficial interests.

14. Cost of Living Allowances and Salary Adjustments

300. In 1946 the cost of living allowances were estimated at £200,000 as entered in Table 1, column 2. As a result of the reorganisation of the Local Civil Service and the forthcoming review of all salaries, these allowances may be absorbed into salaries and wages. It is unlikely, however, that the provision in 1946 will be adequate in future years when staff is increased, so that entries are made of £30,000 in column 3, rising to £50,000 in column 7.

15. Pensions and Gratuities

301. The estimate for 1946 was £162,300 entered in Table 1, column 2. A normal increase is assumed of £30,000 in columns 3 and 7, chiefly on account of the rapid rate of retirement which is likely during the next few years as a result of the war.

302. The development plan involves the employment of considerable numbers of staff on short-term contracts who will receive gratuities at the end of service. Accordingly additional provision is made of £10,000 in column 4, rising to £15,000 in column 8.

16. Public Debt

303. The existing annual charge of £183,700 entered in Table 1, column 2, is assumed to continue throughout the decennium and beyond. It is proposed that a new loan of £2,000,000 should be raised during the ten years to cover certain of the development schemes. Among these would be part or whole of £1,500,000 for urban development (para. 277), the two funds of £500,000 each for housing Government staff and African housing (paras. 281 and 286), £400,000 on Government offices (para. 207) and the £819,000 for roads (para. 259).

304. It is assumed that interest and amortization on this new loan will be at 3% per annum. It will be unnecessary to raise all the loan immediately, so that provision is made in column 4 for 3% on a £2,000,000 loan for five years out of the ten, whereas interest at the full annual rate is entered in column 8. The amounts are, therefore, £30,000 in column 4, rising to £60,000 in column 8.

17. Emergency and Special Expenditure

305. Part of the expenditure shown under Emergency Services in 1946 is regarded as being absorbed in future years into departmental expenditure and is thus provided for in various parts of the plan. The largest consumer of emergency expenditure at present is Civil Reabsorption in respect of training ex-service men; some of the expenditure incurred has been shown under Health and Education since it will presumably continue in some form after the immediate reasons for this training have passed. The bulk of the expenditure incurred by Civil Reabsorption is not, however, expected to continue for more than two or three years. It is hoped that expenditure on the controls introduced during the war will soon be no longer necessary.

306. Special expenditure amounted to more than £250,000 in the 1946 estimates, and although much is provided for in development measures, some additional expenditure will, no doubt, be incurred each year under this head.

307. No provision is made in this development plan for either Emergency or Special expenditure since all necessary foreseeable projects have been provided for under other heads. Some such expenditure is, however, bound to arise and is assumed to be covered by the Reserve in Table 1 and by the difference between actual revenue and the average forecast of £3,500,000 for the next ten years on which the plan is based. In 1946 the average has already been much exceeded because the latest estimate of revenue amounts to more than £4,000,000. If, however, such expenditure cannot be met in the manner suggested, and in so far as it cannot be curtailed, it may be necessary to raise a further loan out of which might be paid certain items in column 5 additional to those mentioned in para. 303.

VII. SPECIAL DEVELOPMENTS

1. Pilot Schemes*†

(*a*) *Introductory*

308. The benefits from all development schemes considered in Chapters IV to VI will be spread more or less evenly through the Protectorate. The effect during the next ten years may be pronounced in some areas and almost insignificant in others; in no area is it likely to be great enough to show what the country and the people will be like when fully developed. Moreover, with a few exceptions, the proposed measures are directed to those parts of the country which are already inhabited. The greatest asset of Uganda—its unused land and water—will remain undeveloped by the above programme, except in so far as an increasing population may expand into some areas. The unused land should not, indeed, be densely inhabited until the most efficient methods of using it have been ascertained and a technique has been worked out for grafting those methods on to an African mode of life. Therefore, in addition to the general effort throughout the country, it is proposed that certain areas should be selected for more intense development as pilot schemes, directed especially to the problem of bringing unused land and water into production.

309. A pilot scheme should be not only a place to try out ideas of efficient land use, social services and the like, but also an area of intensive production so that the scheme will itself produce revenue. Therefore, while a considerable part of productive activity would be devoted to the sustenance of the inhabitants, providing them with an ample and balanced diet, there should be a large surplus of production for export. Thereby the pilot area would maintain its people and resources in an equilibrium suitable for a country which looks forward to an expanding economy.

310. The way in which one small part of a pioneer country can be of inestimable benefit to the whole, if intensively developed, is shown by the Gezira area of the Sudan. In it a system of agriculture entirely novel to the Sudan has been adopted by the Sudan Plantations Syndicate, and more recently, in modified form, by the Sudan Government. Cultivation is based on economic units, water supplies are completely controlled, supervision is intense so that the scientific results from the neighbouring research farm at Wad Medani can be applied without delay. From this small area of less than a million acres wealth has run into the pockets of the peasant cultivators and of the Syndicate's shareholders, and the balance has enabled the Sudan Government to build up a financial reserve which is now being used for the development of productive and social services in other parts of the country. I do not suggest that the special features of the Gezira scheme could be applied directly to any part of Uganda: the syndicate principle would clearly be incompatible with native policy, and a scheme for intensive development of Uganda would, no doubt, be based more on rainfall than on irrigation. Nevertheless, the Gezira is an example from which much could be learned as applying to the future of Uganda.

311. Another part of the Sudan, the inland delta of the River Gash, may be of special importance in connection with the methods of organising a pilot scheme in Uganda. It is in charge of the Gash Board, an official body of Government, and is organised for the benefit of the tenant farmers with Government taking part of the profits. The Board is comprised of *ex-officio* directors with the Director of Agriculture as chairman; it functions through a resident manager, with staff

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* The ideas advanced in this section have been contributed by many people in addition to myself. Various memoranda on settlement schemes have been examined, including one of special importance by the Director of Agriculture. The first draft of an idealised scheme was prepared and circulated to heads of departments, and the section has been written in the light of their comments.

† See Postscript, para. 420.

living in the area. Government acts as banker to the Board, but the accounts are kept separately, and a cess levied on the cotton crop is divided into two halves, one half being used in the direct interest of the peasants and the other going to a reserve fund, and to Government revenue.

312. The proposed pilot schemes in Uganda can be compared also with the "development centres" proposed in the plan for Northern Rhodesia, but whereas in Northern Rhodesia the emphasis is laid on training African personnel, it is proposed that the pilot schemes of Uganda should concentrate on the efficient use of land in areas large enough to be representative of the country as a whole. Perhaps a better comparison is with the "public utility companies" advocated for certain Middle East countries by B. A. Keen (1946, *Agricultural Development of the Middle East*). This applies particularly to the agricultural aspects of pilot schemes, while other principles in the use of land and water with reference to the Middle East countries are described by Worthington (1946, *Middle East Science*).

313. Up to now any attempts to develop settled areas in Uganda under close supervision, such as Ajeluk in Teso District, and attempts to induce cultivators to settle in tsetse fly clearings, have been rather disappointing. Even where there has been initial enthusiasm, loss of interest on the part of the settlers has supervened within a few years. I suggest that this has occurred because the settlements have been planned on too small a scale. The basis of a pilot scheme such as I envisage would be an area of about 500 square miles, with a group of Europeans comparable to a District team in close control for perhaps the first ten years. After that most of the Europeans might be withdrawn leaving continued supervision to their African assistants.

314. The problems of developing Uganda differ widely according to whether the land is already closely inhabited or is nearly vacant on account of tsetse fly. This suggests two kinds of pilot scheme, one involving close settlement in an uninhabited area, the other involving recasting the system of land use in an area already settled. The former is more important in showing the way to increased production because more than half of the country is now infested by fly. It would also be easier, and would have the immediate effect of bringing new land into production. It is therefore more suitable for a first attempt. The ultimate object would be to demonstrate on a large and revenue-producing scale that a high degree of supervision will solve the problem of achieving a rate of sustained production per unit area and per head of population much higher than is yet customary in native areas.

315. Public services in a pilot scheme should not be perfect. They should approximate to what may be possible in all parts of Uganda in ten or twenty years' time. In the Protectorate as a whole, recurrent expenditure on all public services amounts at present to about £4 or £5 per family per annum; in a pilot scheme it would be about £8 per family so that all services would be rather better than elsewhere. It is contended that about twice the public expenditure per head will be worth while in paying economic dividends, if expenditure is apportioned in the right way, with a higher proportion devoted to productive services than is possible elsewhere. If this contention proves to be correct in pilot schemes, and if the drive for increased production in the rest of the country results in a buoyant revenue, experience gained in pilot schemes will be directly applicable to other parts of the country about ten years hence.

316. The project for pilot schemes is still in a formative stage. Discussions at Government headquarters and in the Provinces have revealed enthusiasm in some quarters and criticism in others. It has been suggested that the investment of a large sum of money in one part of Uganda would lead to political difficulties; also that it would be an expensive gamble and that it would be better to split the money and effort into half-a-dozen small schemes as demonstration areas in different geographic and tribal conditions. If it were financially possible to start six or so pilot schemes at the same time I would advocate such action, but I cannot agree that the size of each should be drastically reduced in order to spread the effort widely. If the principle of pilot schemes is accepted, it will be far better to have one or perhaps two real achievements than to have a number

of which the results are inconclusive. Once the first scheme has proved to be economic, the number can be multiplied.

(b) Organisation and Layout

317. The main features of a pilot scheme are suggested below, and the principles of layout designed to use fully the natural resources of land and water are illustrated diagramatically in Figure 9. It is unlikely that any part of Uganda would lend itself to development exactly as in the diagram, but several of the catchments mentioned later might approximate to that condition.

318. The ideal area would consist of one catchment covering 500 square miles or so, say 25 miles in length by 20 miles in breadth, and would include the shore of a lake giving access to an undeveloped fishery. It would be underpopulated or perhaps entirely without inhabitants on account of tsetse fly, but near to an area of relatively dense population, and it would be as typical as may be of the rest of Uganda's undeveloped country. Boundaries, whether international, inter district, or inter-farm are all too frequently drawn along streams, which are obvious on the ground and on the map. This militates against satisfactory use of land in a country where the basis of development should be the control of water flow in the soil and in streams. Therefore the boundary of a pilot scheme should be the watershed.

319. *General organisation.*—In an uninhabited and tsetse-infested area a scheme could be started best as a large Government estate employing paid labour and as much mechanical assistance as is feasible. This stage might continue for at least five years. Once the land is broken, woodlands conserved or planted, water supplies established, rivers brought under control, and villages built, it could be changed gradually to a system of land tenure based on community, clan or individual holdings according to the customs of the people concerned. Even at that late stage a suitable area, perhaps 10,000 acres, should be maintained as a Government farm producing revenue, with the rest of the scheme surrounding it farmed by tenants. The Government farm would include workshops for servicing mechanical implements for the whole scheme.

320. The initial work would consist of extensive bush clearing and extermination of wild animals, preferably starting from near the coast at the lower end of the drainage system and working upstream on internal lines of communication, leaving forest on the watershed. A supplementary initial settlement might be established in the upper part of the valley. Large numbers of labourers would be required and the object would be to employ as labourers those people who wish to enter and settle in the area on account of former association with it. If enough of these do not come forward, the scheme should be opened to members of other tribes. As soon as initial clearings have been made and houses erected, the labourers would be encouraged to bring their families to reside, while themselves undertaking to continue in employment for a considerable period.

321. The scheme would be under closer supervision from Europeans and their subordinates than has yet been attempted in Uganda. In the early stages, perhaps for ten years, roughly a District team consisting of an administrator, an agricultural officer, a medical officer and, perhaps, others would operate in an area about the size of one county.

322. *Communications.*—The area should have easy communications with the outside, especially to a railway or to a main port. If adjacent to a lake, a port would be established as part of the scheme with an all-weather road running from it to the capital village, and communicating inland with a railway or a centre of the Provincial Administration. If this road is best constructed along the watershed it would have an all-weather branch to the capital village. From the capital secondary roads would radiate to all other villages, of which there might be about ten.

323. *Forests.*—About 10% of the whole area, say 50 square miles, would be maintained under permanent forest or plantations, and these would be under full working plans. If possible all the forest land would be along the watershed surrounding the scheme, perhaps with projections inwards along the principal ridges, and possibly with tongues of riverain forest projecting down the tributary

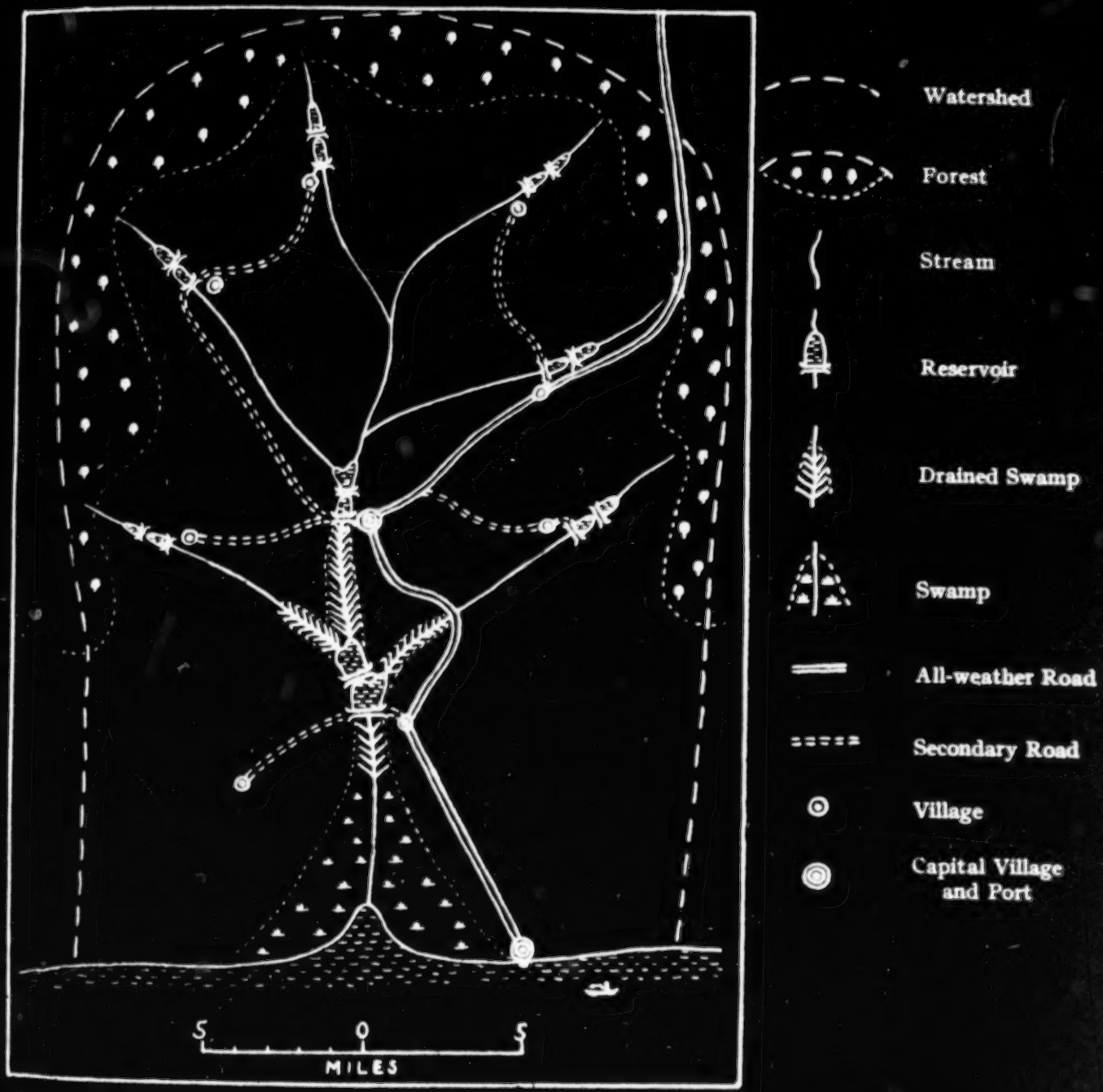

FIGURE 9.—LAYOUT OF A PILOT DEVELOPMENT SCHEME

The ideas expressed in this diagram are intended to be a basis for discussion when a pilot scheme is planned

streams. Forest, if dense enough to maintain a closed canopy, is safe from fly, even though it may contain game and other animals. The object therefore would be to thicken the forest growth sufficiently to exclude fly, and to maintain an abrupt margin between the forest and the agricultural land where the population must be sufficiently dense to exterminate game. In addition to the forest, plantations for poles and firewood would be established near the villages.

324. *Water control.*—Surface water would be stored where possible, for domestic purposes and for irrigation, and thereby the streams would be brought under full control. Water storage by dams depends greatly on local conditions, and a preliminary hydrological survey would be required. The forests in the upper reaches of the catchment would favour the creation of perennial streams and consequently would facilitate storage on the fringe of the forest. Again, in the swamps of the lower reaches, nature has generally created a shallow perched acquifer by stemming the flow with vegetation and by water-proofing the bottom with deposited soils. Therefore both at the head waters and in the lower reaches storage of surface water is not likely to present special engineering problems. Dams would be in pairs on each tributary and in the main valley, so that the principle of maintaining a permanent supply while using the reservoirs for fish culture when full or vegetable cultivation when empty can be applied (see para. 58). The object would be to establish pairs of reservoirs at not more than five miles apart. Close to each pair of reservoirs a village would be established, down stream of the dams in order not to contaminate the water and ultimately to enable a piped water supply to be installed.

325. In the middle reaches of the valley conditions are likely to be less favourable for surface water-storage, and supplies may be provided more easily by drilling. Boreholes would also be installed if conditions were favourable, between the reservoirs so that no permanent habitations would be more than one or two miles from a water supply. Boreholes might also be required at each village in order to reduce water-borne disease to a minimum.

326. *Population.*—Initially, until tsetse fly is controlled over considerable areas and the danger of sleeping sickness is reduced, the settlements must be large, consisting of perhaps one hundred families each. Full advantage should be taken of the experience of settling fly clearings elsewhere, particularly in Tanganyika Territory (see H. Fairbairn—the Agricultural Problems Posed by Sleeping Sickness Settlements—*E.A. Agric. Journal*, Vol. IX). Ultimately the population of the scheme should increase to at least 6,000 families so that the capacity of the land could be fully used. There would be nine or ten villages in addition to the capital village in the centre, one being on the lake shore functioning as a port and a fishing centre. Each village might consist of about 50 families, with the capital about three times as large. Thus some 600 families would live in villages and the capital. On the basis of a total population of 6,000 families, the remaining 5,400 would be mainly in small agricultural and a few forestry settlements of, say, twenty families each. Thus each village would be a focal point of 25 or 30 agricultural settlements. The capital would include residences for the European staff and central offices for the whole scheme.

327. *Agriculture.*—Assuming the area of the scheme to be 500 square miles, and deducting 10% as forests and 10% as unusable swamp or rocky land, there would be 400 square miles available for cultivation and animal industry. Of the total 6,000 families, 400 might be engaged on forestry and fisheries, 600 living in villages as traders, artizans and in similar occupations, leaving 5,000 families on the land. Thus there would be on average about 50 acres of land per family for all purposes, say 10 acres cultivated, and 40 acres lying fallow or as permanent grazing. The land would not, however, be parcelled out into individual or clan holdings in the early stages.

328. The central Government farm, like all other features of the scheme, would need detailed planning. It might be arranged on modified estate lines with less supervision from Europeans but with more from Africans than is customary on alienated land. Cultivation would be largely by mechanical means, and a choice would have to be made between the many possible export crops.

It may be desirable to include several export crops in order to point the way for the Protectorate as a whole to get away from too much reliance on cotton and coffee. The whole pilot scheme would be self-reliant in growing its own food either on part of the Government farm or on separate shambas allocated to the groups of employees.

329. The agricultural areas would consist of the following:—

(*a*) There would be small irrigated shambas devoted mainly to vegetable crops at most villages, using surplus water from the reservoirs. In addition, parts of the swamps would be developed for cultivation and would grow food and export crops irrigated from the reservoirs above (see para. 131).

(*b*) Most of the cultivation would be based on rain and would be in contour-strips on the sides of the valleys below the forest line. The sloping land would thereby ultimately become terraced.

(*c*) Permanent grazing lands would mostly be on the ridges between the cultivated slopes, thereby maintaining a grass cover to supplement the effect of forests in slowing down the run-off. In dr seasons the animals would have to be moved to near permanent water and would graze mainly on the fallow lands and possibly in the swamps. Grazing of fallows is particularly desirable because there is evidence that the fertility of many soils in Uganda is improved thereby. Swamp grazing should be avoided if possible on account of the danger of animal diseases. With mechanical farm implements it might be possible to conserve grass as hay or silage and thereby reduce grazing on wet lands to a minimum.

330. *Fisheries.*—A fishery would be opened up in the lake adjoining the pilot scheme, based on the port and one or more fishing villages. The close control envisaged in the whole scheme would give opportunity for trying out new methods of fishing and the principle of the "mother-ship" with mechanical power (see para. 121). Improved methods of curing and marketing the catch could also be introduced. In the reservoirs large crops of cultured fish would be expected.

331. *Social services.*—It would not be desirable in a pilot scheme to institute a complete system of education and curative medicine because such is unlikely to be possible in the country as a whole for several decades. There would be opportunity, however, for providing social services rather better than those in the rest of the Protectorate. They would be based on the village units, that is 500 or 600 families, including those living in the village itself and on the surrounding agricultural land. A special effort might be made in health work by having a health centre and visitors attached to a small dispensary in each village. There would also be a central hospital for the scheme in the capital village. Within the financial allocation for health work it should be possible to provide perhaps two hospital or dispensary beds per 1,000 of the population, which is more than double the average for the whole country.

332. If each family has on an average one child of primary school age, between six and thirteen years, there would be 500 or 600 children in each village area. The system of primary education might provide for educating about one-half of them, which would be a much higher proportion than the rest of the Protectorate. This would involve establishing about twenty primary schools, two in each village. Secondary education would be provided by a secondary school for boys, and if possible, another for girls in the capital village, and in addition, a post-primary agricultural school should be a permanent feature of the scheme. The question may arise whether the whole educational system might be provided directly by Government without using the agency of missions.

333. Other social services would take their place, and the pilot scheme would be a favourable experimental ground for the new Department of Public Relations and Social Welfare. For example, welfare centres on modest lines would be established in each village, and a thorough probationary system might be inaugurated. The organisation of labour would require special attention, especially during the early years when all settlers are Government employees, and accordingly it might be

desirable to open a branch office of the Labour Department in the capital village. A prison would presumably also be needed.

334. *Buildings.*—During the early years all buildings should be modest in character and where possible made of local materials. Bricks, murram blocks, and tiles would be made locally, and if the area is favourable lime would be burned and a saw-mill within the area would produce timber. Labour for building, as also for road making and other public works, would be drawn from the general labour pool comprising all the settlers. Therefore relatively small amounts of capital expenditure would be required for buildings. Houses for the settlers would be built by the settlers themselves, who would be employed for doing so.

335. With the principles outlined above in mind, several parts of Uganda have been selected as possible for pilot development schemes and are shown in Figure 10. After brief examination I conclude that the most suitable for an initial scheme will be South Busoga, using land which was once among the most productive parts of Uganda but has been largely uninhabited since the great epidemic of sleeping sickness at the beginning of the century. The second choice goes to two catchments in the north of the Protectorate, drained by the Rivers Anau and Aswa. Proposals concerning these areas are made below, and are followed by notes about the other possible areas. It must be stressed, however, that before a final choice of any area can be made the results of a survey of local conditions, including surface and underground water, soils, vegetation, tsetse fly and game must be available, for on such knowledge largely hangs the success or failure of any scheme.

(c) *South Busoga*

336. The area provisionally selected for the first pilot scheme lies along the coast of Lake Victoria between Jinja and Mjanji and is about 50 miles long by about 10 miles wide, with a deeply indented shore line. The area is bounded on the north by a rather indefinite watershed, and is drained southward by a series of short streams running through swamps before reaching the lake. Whereas the whole area comprises rather more than 500 square miles, it can conveniently be divided into five or six main catchments of about 100 square miles each. Proceeding eastward, there is first the country surrounding Thruston Bay with the leper settlement of Buluba at its head, second, the area draining to Hannington Bay with several former fishing villages including the old port of Kityerera. Further east there are two main catchment divisions draining to McDonald Bay, and finally the country just west of Mjanji, centred on the fishing village of Lugala. The whole area is infested with tsetse fly and there is danger of sleeping sickness, which has recurred from time to time since the great epidemic at the beginning of the century when practically all the surviving population was removed far inland. Therefore any attempt to reclaim this country must be done thoroughly with full supervision from medical authorities.

337. Prior to 1900 the area was heavily populated and highly productive. In fact, it was known as "The Garden of Uganda". The western part, comprising the country known as Bunya, alone included five sazas of which one with headquarters at Kityerera had a population of some 25,000 taxpayers. Bunya today is all one saza with about 2,000 tax payers in all. The vegetation of the area is open forest, including a good deal of mvuli, and lies within the belt of elephant grass except for a strip along the shore line which is much less fertile than inland (see Figure 5). There was formerly a saw-mill at Kityerera from which mvuli was taken out by water. The original survivors of the sleeping sickness epidemics, now living inland, have increased considerably in numbers in common with the rest of the Basoga tribe, and are now anxious to return to their former lands, especially to the coastal areas where they once had flourishing fisheries. Consequently many of the desiderata for a pilot development scheme are complied with.

338. Activities against tsetse fly in this area have been mainly of a defensive kind up to now, with the object of preventing its northward spread (see Figure 4). A clearing 1,000 yards wide

has been driven from the road to Buluba, south-east for a distance of eight miles to Ikulwe, around which the clearing has been extended for several square miles. In all, about ten square miles of country have been cleared of bush, leaving isolated trees, at a cost of about £10,000. From Ikulwe a road has been driven north-east for another eight miles or so, much of it through forest, but clearing operations on either side have not yet been started. It had been intended to continue the defensive clearing eastward from Ikulwe for a distance of twenty miles or so.

339. At Ikulwe there is a full saza headquarters of which the buildings cost about £15,000, but they are not used at present. It had been hoped that the clearing would have been settled rapidly and thereby permanently maintained by cultivators, but the process has been disappointingly slow and those few settlers who are now in the clearing appear to belong mostly to tribes other than the Basoga. The Basoga themselves give three reasons why they are not establishing themselves here: firstly, their main wish is to go back to the coastal lands and especially to the fishing villages rather than to remain inland; secondly they have fear of sleeping sickness; thirdly, there is a lack of building poles in the cleared area.

340. If the principles advanced above for the layout of a pilot scheme are accepted, much of the work undertaken to date is on the wrong lines. Clearings are mainly along the watershed, where ultimately dense forests should prevail, and are designed to run along the periphery of the area instead of starting at one or two focal points and extending outward, keeping to a minimum the dangerous junction between clearing and forest. I propose therefore that a radical change in these operations should be made. The main effort should be directed at the heart of the area, maintaining the present defence line and road as an outlet to the north-west. About 100 square miles to the north of Hannington Bay, should be the first object for full development. A fishing village and port should be established either at Kityerera or Lwanika, and from there initial clearing work should expand inland, while a second attack should be developed southward from Ikulwe. The two large areas initially cleared of fly should then be connected by a broad clearing along one of the two roads which formerly connected Lwanika and Kityerera to Ikulwe: of the two the road from Lwanika is the shorter. At the port fishing operations should be started early, under close control, thereby opening a new fishing area which has been closed for many years and for that reason is likely to be highly productive. The initial settlement at the port will have to be very dense to make it safe from sleeping sickness, but it would extend inland rapidly, bringing land under cultivation. Since some of the land to be cleared contains valuable timber, operations in the early stage should include a saw-mill from which the timber not required for the pilot scheme itself would be transported by water to other parts of Uganda or to Kenya, so that the scheme would start to earn revenue at an early stage.

341. When a coastal settlement is well established and is connected in Ikulwe, the whole initial area of 100 square miles could be closely examined and detailed plans made for the eventual layout on lines approximating to Figure 9. This would be greatly assisted by air photographs and for this reason the coastal lands of South Busoga should be given high priority for air survey (see para. 64). In the early stages Ikulwe should be regarded as the capital village of the scheme, thereby saving considerable expenditure on buildings. Later on, when the scheme is extended to include other catchments, the capital may have to be moved to a more central site, perhaps to one of the original saza headquarters. Communication of the scheme with the outside world would be easier in South Busoga than in most other possible areas for pilot schemes. Eventually a number of small ports and fishing villages should be established along the Lake Victoria littoral, and heavy transport would be mainly by water to Jinja, which is only two or three hours by launch from Lwanika and Kityerera. The whole area will be within easy range of the proposed hydro-electric power at Jinja, so that the lay-out should be designed to use electricity for pumping water and many other purposes for which power is required.

FIGURE 10.—POSSIBLE AREAS FOR PILOT SCHEMES

The areas, each of 500 to 800 square miles, are shown in red

(d) River Anau and River Aswa

342. The possibilities of establishing pilot schemes in the catchments of the rivers Anau and Aswa, which are marked on Figure 10, may be considered together. The two schemes strike at the basic problems of the West Nile and Acholi Districts of which development has been somewhat neglected in spite of the opportunities offered by their hard-working inhabitants. Details of the schemes will depend on problems of transport which cannot yet be settled, and on the project advanced by Egypt for converting Lake Albert into a reservoir. In view of these uncertainties there should be two plans for this part of the Nile Basin, Plan A based on the present conditions, and Plan B to be brought into action if Lake Albert is made into a reservoir.

343. The main feature of plan A should be the full development of the Anau drainage basin, while at the same time the peoples living near the river who would have to be moved if the reservoir is constructed, should be contacted more than at present so that they can be more easily administered if they have to be moved. If communications remain poor, it may be wise to concentrate on those developments which lead to a self-contained economy and to trade with the neighbouring territories of the Belgian Congo and the Southern Sudan. In this the experience gained in the experiment on "social emergence" of the Yambio District of the Sudan should be of value (see Worthington, 1946, *Middle East Science*, page 4).

344. In Plan B it should be assumed, not only that Lake Albert will be turned into a reservoir with a large dam probably near Nimule, but also that communications will be greatly improved, probably by a railway and certainly by new ports on the enlarged Lake Albert. In such case produce will be more easily transported and this part of Uganda will be able to progress on an external rather than an internal economy. An essential part of the Plan B would be the opening of the River Aswa catchment area, and the moving into it of Acholi from the east and of riverain peoples, especially the Alur, who would have to be moved from the western banks of the Albert Nile. If both Plans A and B come into operation, there would be a pilot development scheme on each side of the river. They would be separated by perhaps fifteen miles of water, with a large fishery, and with ports at the mouths of the Anau and Aswa.

345. *River Anau.*—This catchment has been suggested as suitable for intensive development by the District team and a report has been prepared with this in mind. Compared with the idealised layout (Figure 9), the system of land use is wrong, chiefly because the lower part of the Anau basin is infested with fly, and this has caused a concentration of people at the head of the valley and on the watershed which separates Uganda from the Belgian Congo. The essence of the scheme would be the moving of human settlement from the ridges to the lower parts of the valley, which are at present inhabited mainly by the white rhinoceros and tsetse flies. The process can be envisaged in four waves of development proceeding from the headwaters downward. First, the flow of the streams would be brought under control by the construction of dams; second, cultivation would spread downstream, clearing the land of bush and fly in the process and releasing some of the overworked land near the headwaters; third, animal industry, which is an important part of West Nile agriculture, would move down in the rear and safe from fly; fourth, forests would be re-established on the watershed from which they have been entirely destroyed on the Uganda side, and plantations for poles and firewood would be established right through the catchment area. The advance of human beings with cultivation in the van would drive the game animals out of the developed area. The main sufferer would be the white rhinoceros which, however, would retain strongholds further north in other parts of West Nile District. The fact that the Anau catchment is well watered with permanent streams gives first-rate opportunities for dams and irrigation. It also involves special medical problems requiring detailed attention, especially bilharziasis, which is tending to spread throughout the district.

346. *River Aswa.*—This river on the east side of the Nile originates near Gulu and after receiving a number of tributaries enters the Nile near Pakwach. Most of the catchment is at present part

of a sleeping sickness reserve, and therefore uninhabited, but a section of the Acholi tribe is established near the headwaters. It is about the right size for a pilot scheme and has already areas of forest near the watershed which could be enlarged by plantations. Settlers in the upper part of the valley would be Acholi, who are already anxious to colonise the area, while those in the lower part would comprise some 3,000 families of Jonam, now living on the west bank of the Nile in country which would have to be evacuated if the reservoir is constructed. The Jonam are nearly related to the Acholi with whom they tend to intermarry, so that the two tribes might combine successfully in a pilot scheme. Communications would be mainly by water, with steamers plying from the new port at Ndaiga Bay at the south end of Lake Albert to Nimule, and also by the projected road from Gulu to Pakwach, which would form the boundary between the Aswa development scheme on the north and the game reserve on the south.

347. The Anau and Aswa schemes should not be inaugurated immediately, but it is proposed that preliminary work of an exploratory kind, including, perhaps, the initial stages of water control and afforestation, should be started as soon as facilities offer.

(e) *Other Possible Areas*

348. Areas which may be suitable for pilot schemes marked on Figure 10, other than those already discussed, are mentioned below. With the exception of Nkusi river, part of which would lie in Mubende District, none of these is in Buganda Province, because the mailo system of land tenure would not lend itself to the kind of layout envisaged, unless a large number of mailo owners were to pool their land and resources. There is, however, much Crown land in the northern part of Buganda, including most of the swamps, so that the possibility of a pilot scheme in that province need not be entirely ruled out. For example, the Bugerere peninsula west of the Victoria Nile, or the Tweyanze area, both of which have been invaded by tsetse fly, might be reclaimed as pilot schemes at a later date.

349. *North Kigezi.*—A settlement scheme in this area is already in progress in order to relieve over-population in the area near Kabale inhabited by the Bakiga tribe. A survey near Kabale in 1936 showed the average area of cultivable land per taxpayer to be about 10·5 acres. A similar survey in 1945 gave a comparable figure of less than five acres per taxpayer and less than one acre per head of population. Accordingly a large number of people is being moved to the outskirts of Kigezi District where the mountainous country slopes northward to the plain adjoining Lake Edward. An intensification of this settlement area on the lines proposed for a pilot scheme would have advantage, particularly because the people concerned are abundant in numbers and are already under close control from their chiefs. It has the disadvantage, however, probably insuperable for a large scheme, of great distance from main lines of communication.

350. *River Mpanga in Toro District.*—The area through which the Mpanga flows between Fort Portal and Lake George is potentially among the richest in the country. It was originally in the hands of Bahima cattle owners who vacated after the great rinderpest epidemic of 1893, and since then there have been only small settlements of scattered population. The River Mpanga is perennial and flows first through a large area of forest, as yet undeveloped, and then swings to the west descending the escarpment in a gorge where there may be opportunities for hydro-electric development. This area is not suggested as having high priority because as yet there is not a large population in the neighbourhood which would be suitable as settlers. It should, however, be examined as a possible site for a pilot scheme for Toro District at a later stage. The establishment of a new headquarters of the Western Province (see para. 204), and the building of a new road to the east of Lake George (see para. 250), may give the opportunity.

351. *River Nkusi.*—This river flows from a wide network of swamps westward down the rift escarpment to the south end of Lake Albert. The area for a pilot scheme would be partly in Bunyoro and partly in Mubende Districts. The area is of high potential production, being

part of the elephant grass country, but is at present little developed and with few people. Communications are poor but are likely to be much improved by the opening of a new port at Ndaiga Bay (see para. 224). This area does not take high priority in the list of possible schemes because as yet there is little population nearby.

352. *North Busoga.*—The North part of Busoga District projecting between the Victoria Nile and Lake Kyoga is within easy reach of main communications by rail and water but is too far north to receive the abundant rain which is characteristic of the Lake Victoria littoral. It would lend itself to intensive development if it were possible to irrigate by gravity from the Nile. This would involve a heavy capital outlay, but the possibility is worth examining on account of the general slope of the country northwards between the levels of Lake Victoria and Lake Kyoga. The future outlook for Uganda would be greatly improved if an irrigation scheme of considerable size were established in order to render one part of the country independent of rainfall. The area has the added advantage of being adjacent to Lake Kyoga where the fishery offers good opportunity for organisation and expansion. Detailed plans for North Busoga must, however, await decisions on the control of the Nile in Uganda (see paras. 267 to 275).

353. *River Malawa.*—This river rises on Mount Elgon and flows south-west, forming part of the frontier between Kenya and Uganda, before swinging north-west near Tororo to form the main headwater of the Mpologoma swamp. The catchment area is partly in Uganda and partly in Kenya. This might complicate administration on account of difference in legislation in the two territories, but a joint development scheme would have the great advantage of helping the two adjacent territories to adopt a common approach to the basic problems of native areas. The Malawa catchment is inhabited by the Kitosh tribe of Kenya and by several tribes of Uganda, so that the scheme would involve modifying existing systems of farming on both sides of the frontier, as well as opening up new country. Communication would be easy because the main railway line runs through the catchment area. Headquarters of the scheme might be at Tororo where a number of existing buildings could be used, thereby saving considerable capital expenditure. The Malawa basin is not a first choice on account of the possible difficulties of joint control, but it is suggested as a subject for interterritorial discussion.

(*f*) *Finance*

354. There is no object in estimating the expenditure of pilot schemes in any detail until the project has been further examined, but in Table 1 a general allocation is made of £1,000,000 during the 10 year period, half of which is entered as recurrent expenditure in column 4 and the other half as non-recurrent in column 5. These totals are broken down in Table 17, columns 2 and 3, merely to indicate that it will be possible to provide adequate services and full control of a first pilot scheme in South Busoga, and preliminary work in the Anau and Aswa catchments, within the allocation.

355. Columns 2, 3 and 4 of Table 17 correspond in total with the entries against pilot schemes in columns 4, 5 and 6 of Table 1. A residual recurrent expenditure of £20,000 at the end of the 10 year period is entered in Table 1, column 8, and £30,000 is entered in column 10 as revenue which might be expected from the scheme after ten years' operations. These last two entries are made on the assumption that the first pilot scheme will not prove to be fully economic by the end of ten years. In such case the special staff could be withdrawn and the pilot scheme area would revert at the end of ten years to being an ordinary part of the District in which it is situated. If, on the other hand, the contention of para. 315 proves to be true, and the pilot scheme shows good promise of paying substantial dividends, the special staff would be retained, and the residual expenditure would be greater. In such case the residual expenditure would be more than offset by a much larger revenue return than the £30,000 entered.

356. If a pilot scheme is to be fully economic after ten years it should repay at the rate of at least 3% on the outlay of £1,000,000 plus the residual recurrent expenditure, that is, it should produce

revenue, direct and indirect, at the rate of at least £50,000 per annum. With 500 square miles fully developed the annual return should therefore be not less than Shs. 3/10 per acre per annum, including forest, grazing, arable lands and fisheries. Put it another way: the 6,000 taxpayers should produce revenue at the average rate of at least £8 each per annum.

357. In order to produce a return of this order it is clear that a large part of the enterprise must be devoted to export crops. At the capital village there might be established a processing plant, for example, a sugar-mill or cotton ginneries, to handle the crop not only from the farm itself but from the whole pilot scheme. Whereas the Central Government would take complete responsibility for the scheme until it is a going concern, consideration would, no doubt, be given to handing it over to the Native Administration at a later stage.

358. Accounts of the pilot scheme should be kept separate from general revenue and expenditure. A good system to follow might be that of the Gash Board in the Sudan (see para. 311).

359. This paragraph explains the entries in Table 17.

SOUTH BUSOGA.

A. *Preliminary investigation.*—£3,000 per annum entered in column 2, and £5,000 non-recurrent in column 3, is for detailed studies of the area to be undertaken while the pilot scheme is being developed. They would include surveys, meteorology, hydrology, examination of soil and vegetation, and the like.

B. *Labour.*—£6,000 in column 2 is for a permanent force of about 500 labourers at Shs. 20 per month throughout the period. This would continue after the ten years as the labour force required to run the permanent Government farm. £190,000 in column 3 is for the employment of settlers within the scheme during the early years. The amount would be adequate on the assumption that about 1,000 join the scheme to begin with and increase to the full complement of 6,000 during the first five years.

C. *Tractors and other mechanical equipment.*—This provision is of great importance in order that as much of the initial work as possible is undertaken with mechanical assistance, and subsequently most of the cultivation is also mechanically powered. £30,000 in column 3 is for capital expenditure on the equipment, and £2,000 per annum in column 2 is for maintenance.

D. *Productive Services*:

(i) *Water supplies.*—£20,000 in column 3 is for initial expenditure in constructing dams and drilling boreholes, and £500 in column 2 is for maintaining the supplies once they are in being. The capital allocation is relatively small because most of the cost of constructing dams will be provided by the entry for labour above.

(ii) *Agriculture.*—£6,000 in column 2 provides for a full-time European agricultural officer together with several African assistant agricultural officers and a number of supervisors, and also for a tsetse fly ranger and his subordinate staff, together with other recurrent charges for the full control of all agricultural activities within the scheme. £10,000 in column 3 is for farm buildings and other non-recurrent charges, including the construction of a headquarters for the mechanical equipment.

(iii) *Animal industry.*—£3,000 in column 2 provides salary and wages for a veterinary officer and his staff and general supervision of the animal industry which will be introduced as the area is freed from fly. £5,000 in column 3 provides for animal houses and fencing on part of the permanent Government farm.

(iv) *Forestry.*—£2,500 in column 2 provides for African staff of the Forestry Department operating within the scheme, and other recurrent charges involved in bringing the forest land under working plan and in establishing plantations. £5,000 in column 3 is for a small saw-mill. No provision is made for a permanent European forestry officer because adequate supervision is assumed to be undertaken by visiting staff.

(v) *Fisheries.*—Here again supervision will be by a visiting fisheries officer. £2,000 in column 2 is for African staff of the proposed fisheries department and for the upkeep of motor-boats and equipment required in establishing a fishery on new lines. £5,000 in column 3 is for capital expenditure on motor boats and some shore plant for preserving the catch.

E. Social Services:

(i) *Health.*—£6,000 in column 2 would provide for a European medical officer, at least one nursing sister, two African medical officers, together with health workers and dispensers, and other recurrent charges. £20,000 in column 3 is for the initial buildings and stores for a health service for the whole scheme.

(ii) *Education.*—In the early years it will be desirable to have a European educational officer devoting whole time to the pilot scheme. £4,500 in column 2 is for the salary of this officer and wages for a requisite number of African teachers. The amount, being an average figure for ten years, will start smaller and finish higher because the staff will be increased as the number of children within the scheme increases. £20,000 in column 3 is for school buildings, including a secondary school in the capital village, an agricultural and technical school on the Government farm, and one or more primary schools in each village.

(iii) *Welfare.*—£2,000 in column 2 is for a European welfare officer who might be withdrawn after a few years when the service is established, and for African personnel of the Department of Public Relations and Social Welfare. £4,000 in column 3 should be sufficient for a modest welfare centre in each of the ten villages, and for other initial equipment.

(iv) *Labour organisation.*—£1,000 in column 2 provides staff for a branch office of the Labour Department which would be required during the early years when all the settlers are employed by Government.

(v) *Prison.*—£500 in column 2 and £1,000 in column 3 should be adequate for a prison at the capital village.

F. Common Services:

(i) *Administration and Police.*—£3,500 in column 2 would provide an administrative officer resident within the pilot scheme and possibly also a police officer together with their staff, with a balance for other recurrent charges. £10,000 in column 3 is for central offices at the capital village from which the whole pilot scheme would be administered.

(ii) *Communications.*—At least 100 miles of secondary roads and perhaps 50 miles of all-weather roads would be required. In addition a telephone and telegraph line would be carried to the central office, and postal services established in the principle villages. These facilities are provided by £25,000 in column 3 as capital expenditure and £2,000 in column 2 for maintenance.

(iii) *Village development and Housing.*—Perhaps ten European houses would be required, but a number of these should be temporary because some members of the staff would be resident within the area for only the first few years. Accordingly European houses are averaged at £2,000 instead of £2,500 as in the rest of the development plan. Within the figure of £50,000 in column 3 this leaves a balance of £30,000 available for other buildings, including general housing for Africans. Most of this would be devoted to the purchase of building materials which cannot be made in the pilot scheme area. £500 in column 2 is for the maintenance of Government buildings at about 1% per annum on their capital cost.

ANAU AND ASWA.

An allocation is made in column 3 of £50,000 for exploratory and preparatory work on these schemes so that delay can be avoided in bringing them into action at a later date.

RESERVE.

A reserve of £5,000 in column 2 and £50,000 in column 3, that is, 10% of the whole in each case, is retained against unforeseen eventualities.

TABLE 17.—PILOT SCHEMES

Columns 2, 3 and 4 correspond with columns 4, 5 and 6 of Table 1

Subject	*1947–1956*		
	Average annual recurrent	Non-recurrent in 10 years	Total in 10 years (columns 2 (× 10) + 3)
1	2	3	4
SOUTH BUSOGA:			
A Preliminary investigation	3,000	5,000	35,000
B. Labour	6,000	190,000	250,000
C. Tractors and other mechanical equipment	2,000	30,000	50,000
D. Productive services:			
(i) Water supplies	500	20,000	25,000
(ii) Agriculture	6,000	10,000	70,000
(iii) Animal industry	3,000	5,000	35,000
(iv) Forestry	2,500	5,000	30,000
(v) Fisheries	2,000	5,000	25,000
	14,000	45,000	185,000
E. Social services:			
(i) Health	6,000	20,000	80,000
(ii) Education	4,500	20,000	65,000
(iii) Welfare	2,000	4,000	24,000
(iv) Labour organisation	1,000		10,000
(v) Prisons	500	1,000	6,000
	14,000	45,000	185,000
F. Common services:			
(i) Administration and Police	3,500	10,000	45,000
(ii) Communications	2,000	25,000	45,000
(iii) Village development and housing	500	50,000	55,000
	6,000	85,000	145,000
ANAU AND ASWA	..	50,000	50,000
RESERVE (10%)	5,000	50,000	100,000
TOTAL	50,000	500,000	1,000,000

2. Karamoja District

360. The "Karamoja problem" has been discussed in recent years chiefly in terms of the danger that desert conditions might spread from the direction of Turkana to the green lands of Uganda. Having briefly examined the problem in company with Mr. B. J. Hartley of the Aden Protectorate, who has written a separate report on the subject, the Director of Geological Surveys, the District Commissioner, and other officers, I am of opinion that the danger has been exaggerated. In reaching this conclusion I am fully conscious of the fact that we saw only a small part of the District, from the air and on the ground, at the most favourable time of year and in a season of exceptionally heavy rainfall. I am satisfied, however, that measures undertaken in Karamoja would have application mainly to the District itself and would have little effect on the areas to the south-west around Lake Kyoga, except in so far as control of the drainage of Karamoja would slow down the run-off. This would be of minor importance except to Karamoja itself, because the run-off is already greatly reduced by a large system of swamps before reaching Teso District.

361. Karamoja District is potentially rich and should have a big contribution to make towards the economy of Uganda as a whole, especially in providing fat cattle for slaughter in the consuming areas around Kampala and Jinja with, perhaps, some surplus to continue the export to Kenya which has occurred during the war. The time has arrived when either the District must be maintained as a zoo and a reserve for the backward Karamojong, or considerable effort must be devoted to development and conservation in order to bring the land into fuller use. The former alternative is incompatible with general policy, so that a special development plan should now be adopted for Karamoja in order to bring this District more into line with progress in the rest of the Protectorate. The main object should be to develop and enlarge the cattle industry for which the District is specially suited, but at the same time to make the District self-supporting in other food supplies.

362. The plan consists of seven inter-related projects which are outlined in this paragraph. Controlled grazing of livestock is the crux, and is inherent in each of the projects.

(*a*) *Watershed conservation.*—The upland area along the watershed between Karamoja District and Turkana should be conserved by removing population and stock from a strip of country averaging about ten miles wide, extending along the watershed from Mount Elgon northwards through Kadam and Mount Moroto to Loyoro, a distance in all of about 150 miles. Since this watershed tends to be invaded by Turkana and Suk from the east as well as by the tribes of Karamoja from the west, it would be necessary to have the matter agreed on an interterritorial basis, and action might be required by Kenya as well as by Uganda. A large part of this strip has already been gazetted as forest reserve. It is difficult to forecast what will be the effect of conservation on the natural vegetation of scrub and bush because there is practically no information about rainfall. Until very recently there have been only two rain gauges in the whole District and these have indicated that there is considreably more rain near the mountains along the watershed than on the plain to the west. An integral part of the plan for the District should be the establishment of a number of meteorological stations in order to help to assess the land potential.

(*b*) *Communications.*—A new road will be needed running northward from Moroto to Loyoro along the boundary between the closed strip and the inhabited plain. Another road, which needs re-aligning and being brought up to an all-weather standard, is that connecting westward from Moroto to the road system of Acholi District around Gulu. This last-named road is included in the general road programme (para. 255).

(*c*) *Tsetse control.*—The present system of land use, mainly for grazing but with considerable areas of millet cultivation, must be improved by recovering land from *G. morsitans*, especially in the north-west of the District. Work on this has already started using the principle of selective clearing of bush. Tsetse fly is an ever-present menace to the fly-free areas of Karamoja, so that the position must be kept under constant examination. If population and stock, especially goats, are excluded from the watershed area, the bush is likely to thicken rapidly, even to the extent of

creating a closed canopy in many places, thereby helping to make the watershed impervious to fly. The concentration of population, cattle, and especially goats, on the plain to the west should help to reduce the bush and to encourage grass land and cultivation. Thereby the plain would likewise tend to become fly-proof, especially if the action of stock is assisted by selective clearing.

(*d*) *Water supplies* should be provided at frequent intervals on the plain, especially at a distance from the watershed, in order to allow greater use of the magnificent grazing lands. A start has already been made by drilling boreholes and constructing permanent atapars and dams. A big expansion of such operations is an important part of the plan.

(*e*) *Teso Belt.*—The so-called Teso Forest Belt is two blocks of thinly bushed grassland along the boundary between Teso and Karamoja Districts. From this belt permanent settlement is excluded in the hope that it will defend Teso from the drier conditions of Karamoja and will prevent clashes between the tribes. Little importance can be attributed to the Teso belt in conserving natural resources, but it is probably desirable to continue excluding settlement in it for some years to come, until progress has been achieved in the projects mentioned above.

(*f*) *Agricultural experiments.*—Mr. Hartley has made a special examination of the possibilities of introducing flood irrigation to Karamoja on the Arab system which is highly developed in the Aden Protectorates. This is most desirable and should certainly be attempted if means can be found, but it will be largely experimental during the first ten years. An area of about 1,000 acres adjoining one of the streams flowing westward from Mount Moroto should be earmarked for the purpose, and should also serve as an experimental farm designed to ascertain the best methods of cultivation applicable to the whole district. Adjacent to the experimental farm a government cattle ranch should be established for experiments on controlled grazing and the improvement of livestock.

(*g*) *Social services.*—It is self-evident that development of Karamoja District would be of little value, if [illegible] would it be possible, without parallel development of its inhabitants. Therefore an expansion of social services and an increase in the range and quantity of consumer goods is necessary. In education the experiment might be tried of developing a system under direct control from Government, concentrating on agricultural and technical subjects. Excellent work is already in progress at the mission centre at Lotome, however, and this sets an example which might be followed throughout the District. Much expansion is required in the system of dispensaries and health centres. Not until social services have progressed some way will it be possible to develop fully the cattle industry. As pointed out in para. 104 the special conditions of the war have reduced the head of stock in some places, but as the animal population breeds up again, the owners must be persuaded or compelled to sell the natural increase of their flocks and herds. In this connection the introduction of a livestock tax should be considered during the next few years.

363. This paragraph explains entries in Table 18, of which the subject headings coincide with the seven projects described above:—

A. *Watershed conservation.*—£1,000 in column 2 and 5 is for the initial work of removing population from the watershed area and subsequent policing.

B. *Communications.*—£10,000 in column 3 is for the proposed road along the edge of the conserved area—say 100 miles at £100 per mile. Maintenance is assumed to be covered by the general cost of administration.

C. *Tsetse control.*—No special allocations are made since the work in Karamoja District is included in the general departmental scheme (see para. 85).

D. *Water supplies.*—£80,000 in column 3 is for a 10-year programme which would include the operations of two drilling units and one dam building unit for most of the period.

E. *Teso belt.*—No financial provision is necessary.

F. *Agricultural experiments.*—£3,500 in column 2, rising to £4,000 in column 5, is for recurrent charges of the experimental farm and cattle ranch. £5,000 in column 3 provides for initial irrigation

control works on about 800 acres at £4 per acre, with a balance for fencing and other non-recurrent charges in connection with the cattle ranch.

G. *Social Services.*—£3,500 in column 2, rising to £5,000 in column 5, is for recurrent costs of health and education. £10,000 in column 3 is for building schools, health centres and dispensaries.

364. The total services proposed, additional to those operating at present are thus expected to cost £185,000 during the next ten years. Karamoja District has such potential wealth that indirect return in the form of increased revenue and prosperity is likely to justify this expenditure by the end of the decennium.

TABLE 18.—KARAMOJA DISTRICT SCHEME

Subject	*1947–1956*			*1957*
	Average annual recurrent	Non-recurrent in 10 years	Total in 10 years (columns 2 (× 10) + 3)	*Residual Recurrent*
1	2	3	4	5
	£	£	£	£
A. Watershed conversion	1,000	..	10,000	1,000
B. Communications	..	10,000	10,000	
C. Tsetse Control	..	..	(included in departmental programme, Table 5)	
D. Water supplies	..	80,000	80,000	
E. Teso belt				
F. Agricultural experiments	3,500	5,000	40,000	5,000
G. Social services	3,500	10,000	45,000	5,000
TOTALS	8,000	105,000	185,000	11,000

VIII. SUMMARY

Headings correspond to those of chapters I to VII

I. Introduction

365. The development of Uganda has been proceeding for half a century and now the pace can be increased. All sections of the community will need to co-operate if the results of planned development are to be worth while. A development plan is not a blue-print, and so much depends on revenue that revision will be necessary every few years. A Development and Welfare Committee should be small in membership; and its executive officer must have powers to see the plan through.

II. The Fundamental Problem

366. The average standard of living cannot rise and public services cannot expand unless production increases at a rate greater than population. The reverse is tending to occur in some countries which have passed through the stage of development seen today in Uganda. Based on inadequate statistics it is guessed that the population of Uganda, now about four million, will increase to six million in thirty years' time and ten million in half a century. Ten million people are likely to use the natural resources to capacity, so the factors which tend toward stabilisation of population, and which take at least two generations to operate, should be introduced soon. The next ten years should be devoted to a production drive, while increasing social services at a rate greater than population increase. If success is achieved the country will be able to support mass education and mass health during the following decennium. In the production drive the great asset of Uganda is not manpower, but undeveloped land and water. The main factors limiting development are: (i) lack of fundamental information about the country and its people; (ii) a system of production incompatible with the full use of natural resources; (iii) lack of capacity of the African for physical work; and (iv) power based on the most inefficient of fuels. The plan, while covering the whole field of development, aims to solve the fundamental problem of balance between population and production by reducing these limiting factors. It seems unlikely that adequate results will be achieved without some degree of compulsion of the indigenous people, perhaps equivalent to that which is applied in Britain today.

III. Finance

367. The total funds available for expenditure during the next ten years are estimated. The structure of government expenditure is analysed with reference to the 1946 Estimates and general allocations for the period 1947 to 1956 are made to all heads considered in Chapters IV to VII. The allocations are divided into normal expansion of present activities, and development schemes in which are included all capital and non-recurrent expenditure. A forecast is attempted of residual recurrent expenditure in 1957, of both normal expansion and development schemes, and this leads to a forecast of total recurrent expenditure in 1957 for comparison with that of 1946, in order to assess the probable effect of the development plan. The separation of a development plan from the rest of public finance, on the lines of Kenya's Development and Reconstruction Authority budget, does not seem necessary or desirable in Uganda.

IV. Productive Services

368. *Meteorology.*—Uganda's needs in meteorology are greater for purposes of agriculture, rural water supplies and the like than for air navigation, but there has been a tendency to concentrate effort on the latter. The balance must be redressed, particularly by greatly increasing the number of third-order and rainfall stations. An organisation must be established, too, for analysing the

increased climatological data and making them available. Financial provision is made for an increased contribution to the East African interterritorial meteorological service.

369. *Geology.*—Any new development of mineral resources might improve the country's economic position so greatly, that no effort should be spared in investigation. Provision is made for new staff to speed up exploration.

370. *Hydrology.*—Water is the most important of Uganda's natural resources. The underground supplies are well known through the activity of the Geological Survey, but the surface resources have been little studied in spite of their great potentiality for power and irrigation. Accordingly, a hydrological survey is proposed. If industries develop, water pollution should be prevented.

371. *Water supplies.*—Acute water problems still exist over much of Uganda in spite of the many lakes and rivers and recent activity in drilling boreholes and storing surface run-off. Water supply should be the first of public services in order to bring more land into production, to save labour and to raise standards. Accordingly an increase is proposed in the large programme which has already been approved.

372. *Survey, Land and Mines.*—Triangulation is well advanced except in Karamoja. Topography has progressed far also and will be greatly improved by air survey, for which pilot schemes and part of the Lake Victoria littoral, together with Karamoja, should take priority. Cadastral survey remains a problem on account of the Uganda Agreement of 1900, which still causes a disproportionate part of the survey effort to be devoted to one Province. Doubt is expressed whether the increasing fragmentation of mailo lands will be in the best ultimate interest of the Baganda. But the country needs more surveyors in any case, and therefore provision is made for a much larger survey training school. A Uganda atlas should be published as an aid to planning and to education. The mining section also needs some expansion.

373. *Biological survey.*—Applied research in biological subjects is expanding rapidly but there is insufficient provision for the fundamental studies on which it must be based. A Colonial Biological Survey has been proposed elsewhere, and a small allocation of funds is made as Uganda's share of the cost.

374. *Tsetse control.*—The behaviour of flies, and the results of control measures, are as yet unpredictable. Nevertheless, the tsetse invasion of Uganda is so serious than a full organisation must exist for tackling the fly in selected areas, acting on the best advice which the scientists can give. Therefore full provision is made for a new Tsetse Control Department, including an investigational team. Operations should be founded on an understanding of the reasons for the spread of fly, and suggestions are made on this subject. Attack at strategic points gives more promise than defence.

375. *Agriculture.*—Policy is to protect, improve and develop the natural resources, aiming at the most economic use of land and labour. Limiting factors include lack of knowledge, which must be made good by a survey of present conditions more thorough than yet attempted, an inadequate system of heavy transport, and insufficient and poor facilities for storage both of reserve food and seed supplies and of exports. In addition, inadequate water supplies, tsetse flies, and above all, man-power, limit the extent of land in production. If more supervision can be given the future is promising, the more so as a result of developments of local mineral fertilizers and the possibilities of mechanical assistance in cultivation. Urbanisation demands an intensive market gardening industry in some areas; marketing and inspection of produce requires more attention; and large schemes which are afoot for controlling lake levels may give opportunity for rice cultivation on a considerable scale. With these many problems and projects in mind, provision is made for a considerable expansion of the Agricultural Department, expenditure on storage, mechanical implements, etc., and for a Chair of Agriculture at Makerere College.

376. *Animal industry.*—Most diseases are under control but trypanosomiasis has increased with the spread of tsetse flies so that stock has been drastically reduced in many areas. The present effort in purely veterinary work is adequate for the time being, so that most development can be devoted to improvement of livestock in those areas where they can still live. The livestock industry is handicapped, relative to arable agriculture, by lack of knowledge about the breeds, their feeding requirements, and many related subjects. The leeway on the animal side of agriculture must be made up, and so provision is made for an experimental station, stock farms, and more livestock improvement areas. Allocations are also included for operations against trypanosomiasis and for controlling ticks.

377. *Forestry.*—The capital of standing timber has been seriously reduced during the war, but forests in less accessible areas remain undeveloped. There is need for an expanding programme of timber production, bringing new forests under working plans, and of planting, especially of softwoods for poles and firewood. More protective forests are required on watersheds because the percentage of land under forest reserve, at present 7.8% of the whole, will be insufficient when the country is more fully used for agriculture. Provision is made for more specialist staff, equipment to allow operations in undeveloped forests, plantations for softwoods, poles and fuel, and for a forestry school. Revenue from forests is expected to more than cover expenditure after twenty years' development.

378. *Fisheries.*—The Game Department has done much in this subject, but most of Uganda's waters remain undeveloped. A fisheries department should be established. It should deal with fish culture in reservoirs as well as with the lakes and rivers. Ignorance is still so great that some developments, *e.g.*, of water more than ten miles from land, must await the results of research which will soon be in progress. Fishing craft, the new and promising crocodile fishery, the possibility of manufacturing nets, and marketing arrangements, are among subjects requiring attention. Financial provisions include a contribution to the Lake Victoria Fishery Board and to inter-territorial research, in addition to the establishment of a fisheries department.

379. *Game.*—Wild animals must be ruthlessly controlled in those areas which are scheduled for agricultural development, but encouraged by all possible means in the game reserves. The department is well established and requires but small additional funds for that part of its work concerned with game.

380. *Swamp development.*—Experience in Kigezi has shown that swamps have high productive potential, but the trial of several methods for their reclamation is required before large operations to use the 2,500 square miles of swamp lands of Uganda are justified. The related problem of obliterating swamps near urban areas would likewise benefit from trial of new methods. A financial allocation is made for such experiments.

381. *Co-operative Societies.*—The co-operative movement has a promising future in Uganda, particularly in marketing and supply. Financial provision is included for establishing a co-operative societies department, and for loans to societies.

382. *Secondary industries.*—The processing of primary products is of special importance in stimulating the development of an internal economy in Africa, to supplement the present economy based on exports. There is scope for more in Uganda, for example, textile manufacture. The question of Government contributing capital for such enterprises should be considered. No financial provision is made, except for a small contribution towards inter-territorial research.

V. Social Services

383. *Health.*—Much investigation is required on the degree of importance of the principal diseases as compared with housing, sanitation and nutrition. Better information is required also on vital statistics in order to assess the problems as a basis for planned development. Health

services demand a high degree of decentralisation, while curative medicine needs centralisation in many subjects on account of the specialised equipment and staff required for diagnosis and treatment. During the next ten years modern medical attention cannot reach more than a fraction of the population, but an improved ambulance service will help. Mulago hospital and medical school has high importance as a focal point for the health service of Uganda and a training centre for the East African region, and as such must be on a large but not a luxurious scale. The financial provision for health services is inadequate to meet all that could be wished, but it provides for considerable new staff, Mulago hospital and other hospitals, dispensaries and health centres, ambulance service, a new mental hospital, and surveys of nutrition and of major diseases like malaria, venereal disease and tuberculosis.

384. *Education.*—The plan aims to widen the base of the educational pyramid and to provide for those who fall while climbing it, so that a foundation will be laid for mass primary education and a big development of secondary education which, it is hoped, will occur during the second decennium. In particular, agriculture and handwork need emphasizing in the lower grades and many post-primary agricultural schools should be established. More emphasis is needed on girls' education because Africans must be encouraged to want more, and wants originate in the home. A commercial college is required for training men and women for some branches of public service, *e.g.*, co-operative societies, and for trade and commerce. The change in educational policy which is envisaged requires teachers trained on lines different from those now obtaining, and hence more teacher training centres. There should be a more definite understanding as to finanical responsibility in the educational system. A large part of the financial allocation will be absorbed by expenditure already incurred on existing staff, but it will be possible within the totals to increase academic education for Africans in advance of population increase, and to make progress with agricultural education and other projects. A considerable sum is allocated for new school buildings which must, however, be kept very simple.

385. *Public Relations and Social Welfare.*—The younger generation is beginning to revolt against dullness, and this department of social service will help to provide a new social system to replace the old one which is losing contact with the people. Much of the work will be experimental for several years. It will include courses for influental members of the community, providing welfare centres of a simple kind, and hostels which should be self-supporting except for some capital expenditure, visual propaganda, preferably of a simple kind, and publicity. The new service should help greatly in the production drive as well as in hygiene and other improvements in the standard of living. It will include a probation service. Financial provision is made for staffing the department, establishing a training centre and welfare centres, with amounts for preliminary work in visual propaganda, publicity, mass literacy and adult education.

386. *Uganda Museum.*—The museum should be developed with Government assistance as a cultural centre for the Protectorate. There should be two branches, one devoted to the display of and research on ethnology on lines already firmly established, the other concerned with the future life of the African. In the latter project, all departments of public service should co-operate. A new building, including a lecture hall, is required.

387. *Labour.*—Labour routes from Ruanda-Urundi and West Nile District require some further organisation, and the Labour Department, which will have increasing duties, requires several Provincial and District Offices and more staff. Financial provision is made accordingly.

388. *Prisons.*—Many new buildings are required, but very large expenditure can be avoided because prison labour will be available and camp life is often preferable for prisoners to life behind walls. Prison farms may be good places to try out mechanical implements.

389. *Approved schools.*—Juvenile and adolescent delinquents are not yet specially cared for. Provision is made for an approved school and a Borstal institute.

VI. Common Services

390. *Administration, Law and Defence.*—Administration is the backbone of the development plan. The central Government requires improved offices and there would be advantages in moving them from Entebbe to Kampala. The cost of new offices at Kampala, together with that of moving staff back and forth from Entebbe where many residences would have to remain, would be much greater than that of improving the offices at Entebbe. It is questionable, therefore, whether the expense of a general move to Kampala is justified in relation to the rest of the development plan, but provisional financial allocations are included for the project. New headquarters are required for the Western Province, probably between Fort Portal and Mbarara. Provision is made for these, together with other offices, including a new Provincial office in Kampala.

391. *Police.*—Expansion of services will be achieved mainly by supervision of the Native Administration Police, but the Protectorate force requires a number of new buildings and some increased staff. Provision is made accordingly.

392. *Statistical office.*—Statistical data have great importance in relation to development. Uganda has never had an adequate organisation for giving advice on what to collect or for analysing the data. The Interterritorial Statistical Section is being established with regional headquarters in Nairobi and a basic organisation in Uganda and the other territories. The Uganda office should grow to three expert statisticians and assistants during ten years, and financial provision is made accordingly.

393. *Transport.*—As a general principle cheapness of transport will be more important than speed during the next decade, so water is the best form, railway the second best and road the third. If the efficient distance from Kenya and Uganda Railways and Harbours facilities is taken to be thirty miles for purposes of moving produce, there is a large area in the south-west and another in the north-east as yet unserved. Water transport may be eased by the project for Nile Control, and a new port is proposed at the southern end of Lake Albert. Railway extensions are discussed, and a preliminary extension westward from Kampala to Mubende is proposed, with a project for further extensions from Mubende to remain in abeyance for the time being. A northward extension from Soroti to Nimule depends primarily on decisions beyond the scope of Uganda, but would help development greatly. The programme for Public Works Department roads includes bitumen surfacing on a number of main routes and a new system of maintenance camps. New main road facilities proposed are from Fort Portal to Ndaiga Bay, a causeway across the Kazinga Channel, and several motor ferries. Projects for new main roads from Kampala to Gulu, Kilembe to Mbarara, Tororo to Bugiri require further consideration. New Native Administration roads proposed include Gulu to Pakwach, Masindi to Pakwach, Gulu to Moroto, road on north side of Mount Elgon, and Ruhinda to Lake Edward. Road research on an interterritorial basis is proposed. Requirements for civil aviation are difficult to predict, so large expenditure additional to that already authorised is not considered to be desirable. Financial provision is made for the road programme and for aviation, but not for water and rail transport which are the province of the Kenya and Uganda Railways and Harbours.

394. *Posts and Telecommunications.*—Proposals have been made for making the inter territorial department self-financing, with an organisation similar to the Kenya and Uganda Railways and Harbours. The change could be made at any time without dislocation of services. Claims of the public and of different Government services need to be balanced against each other in deciding what proportion of available funds should be devoted to posts, telegraphs, telephones, and wireless telegraphy. All these requirements are included in the financial plan, but it is somewhat weighted on the side of expanded telephone services because the demand for them is great and capital expenditure is fully justified by revenue earned. Rural post offices are much required to serve the needs of the African and Indian population.

395. *Hydro-electric power and Nile Control.*—Circles with 100-mile radii from the main potential sources of hydro-electric power cover nearly all Uganda, but only one source, near Jinja, is considered. A large scheme involving control of the level of Lake Victoria would provide an ample margin of power above the demand foreseeable within the next ten years, and might give other advantages in connection with water transport, rice cultivation, public works around lake shores, control of mbwa fly, and the manufacture of nitrate fertilisers. In addition, big advantages would accrue to Egypt in connection with controlling the flow of the White Nile and water storage near its headwaters. These considerations taken together will probably justify large capital expenditure, and accordingly the project is now under expert examination.

396. *Urban development.*—The need for planned development is large and growing, and demands heavy expenditure on services such as water supply, sewerage and drainage. Provision is made, suitable for loan fund finance.

397. *Housing Government staff.*—Housing for staff recruited from overseas is provided for under subject headings. Government should assist in the housing of the Local Civil Service by advancing money and by building houses which would be sold or rented to civil servants. A fund which will be largely self-reimbursing is proposed for this purpose.

398. *African housing.*—Heavy subsidies will be required for housing schemes for the general urban population and will include slum clearance, which cannot be economic. The problem of rural housing is more complex and heavy expenditure is not recommended until more is known about it. A general fund for African housing is proposed.

399. *Government buildings and their maintenance.*—The plan includes a large programme of new Government buildings of all kinds. Simplicity of design and the maximum use of local materials should be the rule. Provision is made for maintenance of the new buildings at 1% per annum on capital cost.

400. *Public Works Department—General.*—Many new public works will be placed out to contract. The Public Works Department will, however, need strengthening with many members of staff, who will be employed on short-term contracts where possible. Building research is proposed on an interterritorial basis. Financial provision is made accordingly.

401. *Printing.*—The Government Press should be capable of handling three or four times as much work as before the war, and therefore provision is made for an increase in staff and equipment.

402. *Tourism, national parks and hotels.*—The unique opportunities for visitors need developing by providing tracks in game reserves, with rest-camps and shelters at strategic points. The question of creating national parks will soon require thorough examination and may apply to certain mountain areas as well as parts of the game reserves. Capital expenditure by Government on an hotel at Entebbe should be considered. A fund for these purposes is proposed.

403. *Cost of living allowances and salary adjustments.*—A financial provision is made pending a general review of this subject.

404. *Pensions and gratuities.*—Provision is made for increases likely to be occasioned by more rapid retirement after the war and gratuities for large numbers of staff employed on short-term contracts for development schemes.

405. *Public Debt.*—A new loan is proposed to finance some of the development schemes, and financial provision is made at 3% per annum for interest and amortization.

406. *Emergency and special expenditure.*—Part of emergency expenditure during the war is absorbed into other heads, and the rest is expected to disappear soon. Most special expenditure is likewise provided for elsewhere. Expenditure which cannot be foreseen is certain to arise, and may be met from (*a*) the reserve in Table 1; or (*b*) the excess of revenue over the forecast.

VII. Special Developments

1. *Pilot Schemes*

407. *Introductory.*—Pilot development schemes are advocated as places to try out ideas of land use and social services which will later be applicable to large parts of the Protectorate. They should also be areas of intensive production, at first by state enterprise, in country which is at present largely undeveloped. It is contended that about twice as much expenditure on public services per head of population as that which is possible in the country as a whole will pay dividends after ten years.

408. *Organisation and layout.*—A pilot scheme should preferably occupy one catchment area of about 500 square miles, sparsely inhabited on account of tsetse fly. Settlers numbering up to 6,000 families would be employed for the first few years while the whole area was developed as a Government estate. Later, most would become tenant farmers under close supervision, a part of the scheme being retained as a Government farm. Initial clearing and subsequent cultivation would be undertaken with mechanical assistance where possible. Communications, forestry, water control, agriculture, fisheries, and social services would be organised for the efficient development of land, water and people, with an emphasis on productive services.

409. *South Busoga.*—The coastal area of Busoga, known as "The Garden of Uganda" until the sleeping sickness epidemic at the beginning of the century, is selected as suitable for a first pilot scheme.

410. *River Anau and River Asua catchments.*—Preliminary work should be started in these two areas with a view to establishing both as pilot schemes in a few years' time. This work should be dovetailed into a double development plan for West Nile District and the western part of Acholi District. One part should be based on the *status quo*, the other on the possible conversion of Lake Albert into a reservoir.

411. *Other possible areas* suitable for pilot schemes are detailed.

412. *Finance.*—£1,000,000, being about 6% of moneys available for development during the next ten years, are allocated to pilot schemes. The investment is expected to produce an adequate return after that period, though the financial aspect is subsidiary to the experience which will be gained. The way in which the total might be divided among different projects within a pilot scheme is suggested.

2. *Karamoja District*

413. The danger of the spread of desiccation from Turkana has been exaggerated. The district is potentially wealthy, especially in cattle, and is ready for development. A plan is proposed based on watershed conservation, improved communications, tsetse control, provision of water supplies, agricultural experiments, and social services, with the prime object of developing the cattle industry for the benefit of the Karamojong and of the whole Protectorate.

IX. POSTSCRIPT

APRIL, 1947

414. This report was completed in December, 1946, and was printed in draft form. The draft was considered at an informal conference held on the 9th and 10th April, 1947, between members of the Committee which produced the 1944 report on post-war development, unofficial members of Legislative Council, and Heads of Departments. As a result of this conference and subsequent consultations a number of minor alterations have been made in the text and this postscript has been added. The fact that a postscript is necessary only three months after preparation of the plan, endorses the remarks made in paragraph 4.

415. *Finance.*—In Figure 1 estimated ordinary revenue for 1947 is shown as the original estimate of £3,700,000. The revised estimate as published amounts to £4,358,252. Since publication, however, it has been reduced by about £300,000 owing to adverse weather affecting the cotton crop. Even so the present estimate is more than £4,000,000 so that the final point of the revenue graph should be considerably higher than shown. Recent decisions have also influenced the estimated funds available for development (para. 24) because, in addition to the sums shown, there will probably be £800,000 available for Uganda from the Regional Colonial Development and Welfare Vote. This is made up of two items, one being Uganda's share of reimbursement for expenditure on Civil Reabsorption, and the other an amount payable to Uganda towards the road programme in view of the expenditure from the Regional Vote on construction of the Great North Road in Tanganyika and Kenya. This amount of £800,000, together with the saving mentioned below in paragraph 418, can appropriately be allocated for the time being to the Reserve Fund (para. 29), bringing that fund to more than £1,600,000. This large amount in reserve, representing about 10% of the whole proposed development expenditure, is likely to be required, because detailed estimates made for certain projects since the plan was drafted are considerably higher than the amounts indicated in the body of the report.

416. *Tsetse Control.*—The position has changed considerably since paragraphs 79–87 were written, and is now more serious than was then thought, on account either of a further advance of the fly or of a greater knowledge concerning its distribution resulting from activity by the new Tsetse Control Department. In particular the invasion of Buganda from the north extends considerably further than indicated in Figure 4. According to advice from the technical experts it is now necessary to create a very large defensive clearing in Mengo District and probably another one in the north on the border between Lango and Acholi Districts. As a result the Tsetse Control Department has been compelled to ask for a large additional vote during 1947, and similar requests may well occur in future years, so that the allocations in Table 5 are likely to prove insufficient. Previous experience with defensive clearings has shown that they have not always served their purpose and fly has often appeared behind them. Therefore I suggest that large sums of money should not be expended on defensive works unless it can be ensured beforehand that the clearings will become fully cultivated as soon as they are made, and will remain as productive land.

417. *Social Services.*—It will be apparent that there is only a small provision in the plan for expansion of medical and educational services for the alien communities of Europeans and Asians, in spite of the fact that they provide a large amount of taxation in proportion to their numbers in the population. The reason for this is that, as already accomplished in Nigeria,

Uganda must look forward to the fusion of social services into one common provision for citizens of all races. This does not, of course, preclude a steady development of services for non-African races, provided they are paid for by the people who benefit from them.

418. *Administration.*—Recent discussion has indicated that the building of large central offices at Kampala and a new headquarters for the Western Province may not take place during the next ten years, but that the proposed Buganda Provincial Offices in Kampala are likely to be much more costly than indicated in paragraph 205. Some new departmental offices will also be required, probably in Kampala. This change in policy will save considerable capital expenditure on buildings, and also will save £7,000 per annum, provided in column 4, for transport of staff between Entebbe and Kampala. The saving will amount in all to perhaps £250,000 during the ten-year period.

419. *Public Works Department—General.*—Even assuming that most of the large programme of public works is put out to contract, it is doubtful whether the financial provisions in Table 16 will be adequate to meet the needs of the department during the next ten years. It appears that in constructional work of all kinds there will be a serious bottle-neck caused by insufficient numbers of artisans, because the present system of training in Civil Reabsorption Centres and at Technical Schools is not likely to produce the requisite numbers of skilled men. As soon as the Development Plan gets under way it seems likely that this difficulty will become so acute that drastic methods of overcoming it may have to be instituted. One method might be for the Public Works Department itself to recruit a considerable number of European artisans to whom suitable Africans would be apprenticed. The apprentices need not be highly educated before they handle a hammer and chisel, and after their first year they would be occupied, still as apprentices, on productive work.

420. *Pilot Schemes.*—The plan for Pilot Schemes (paras. 308-359) was worked out and written before details of the Groundnut Scheme in Tanganyika, Northern Rhodesia and Kenya were available for reference. A comparison of the two shows certain features of similarity and certain differences, and therefore some explanation is desirable.

421. There is a fundamental difference in object between the Groundnut Scheme and Pilot Schemes as proposed for Uganda. The main purpose of the Groundnut Scheme is maximum production of an export crop with the minimum of trouble, and hence with the minimum of African labour, and therefore its proposed organisation cuts away from the administrative system which has been evolved for backward colonial territories, and the proportion of European employees to African employees is high. The main object of Pilot Schemes is to overcome the fundamental problem in Uganda's development (paras. 12-22) anticipating the time when Uganda will have an ample human population. Pilot Schemes aim, therefore, at occupying on the land the maximum African population compatible with maximum production within an efficient and economic system of land use; they incorporate a system of administration and public services similar to that which is developed in the rest of the country but in an intensified form.

422. This fundamental difference in purpose is inherent in the outline of organisation given in the Groundnut Scheme report as compared with that proposed for Pilot Schemes. The area proposed for a Pilot Scheme is about 500 square miles in all, of which about 300 square miles would be used for purposes of arable agriculture, including grass leys. 300 square miles is equivalent to about 6 units of the Groundnut Scheme, each comprising 30,000 acres. For 6 Groundnut units the scale of expenditure proposed is about £1,350,000 in 6 years, and employees (other than for initial breaking of the land) would number about 42 Europeans and 1,800 Africans. A Pilot Scheme involves expenditure of about £1,000,000 over 10 years, and residents on the area would be about 6 Europeans (and others for part time) and 6,000 Africans with their families

Thus, while the expenditure is of the same general order, bearing in mind that the Pilot Scheme provides for forestry, fisheries, education and other social services, the difference in the proportion of productive workers emphasises the difference of purpose.

423. It is generally agreed that the Groundnut Scheme system of development, admirable as it may prove to be, has limited application in Africa, chiefly because it cannot cater for closely inhabited areas. But the Pilot Scheme system, being in many respects half way between the present system in Uganda and the Groundnut Scheme system, is aiming straight for the goal in showing the way for the development of the whole country. For these reasons I have found it undesirable to modify the original draft after the Groundnut Scheme report was available. The need for Pilot Schemes in Uganda does not, however, preclude the desirability of development of part of Uganda on Groundnut Scheme principles if suitable areas can be selected for the purpose.

424. Discussion at the conference mentioned in paragraph 414, after Provincial Teams had considered the draft development plan, indicated the following points concerning Pilot Schemes:—

A. In the Eastern Province there is enthusiasm for a Pilot Scheme in South Busoga but on lines somewhat modified from the outline given in paragraphs 336–341. The chief difference proposed is that, on the advice of medical authorities, development of the area should be from the existing defensive clearing in the neighbourhood of Ikulwe rather than from the coast as I proposed.

B. In the Northern Province the proposal for a Pilot Scheme in the Aswa basin as indicated in paragraph 346 is generally approved in spite of the many difficulties which will have to be overcome.

C. In the Western Province it is emphasised that the Settlement Scheme in North Kigezi now proceeding (para. 349) is arranged with the minimum interference by Government and fears are expressed that the close supervision which is inherent in a Pilot Scheme would cause deterioration. Neither the Mpanga area nor the Nkusi (paras. 350–1) are likely to be suitable for many years on account of paucity of population nearby, but another area not previously discussed, near Mitoma, which lies south of the Katonga River in the north-east of Ankole District, is a more promising site for a Pilot Scheme.

D. It was emphasised that the most critical time in the development of a Pilot Scheme will be the change from its organisation as a state farm to a system of land tenure by the settlers.

E. In spite of representations by the Provincial Administration that Pilot Schemes should be administered as an integral part of the district or province in which they happen to be situated, I would emphasise my opinion that, to be successful, each Pilot Scheme must be administered and financed separately from any existing district, that each must have a *full team of Europeans* devoted to the scheme itself and that the head of the team must be a man of exceptional drive, though not necessarily a member of the Provincial Administration.

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